

## Editorial

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*International PM-10, Jaipur is the venue and the event will provide component manufacturers, equipment manufacturers, suppliers and the end users with the latest information on the PM processing of particulate materials & products. Powder metallurgy short course conducted at NFTDC., Hyderabad, during Aug. 2009 was a great success. Trans. of PMAI, Vol.35, 2009 is being published and will also be available on our website www.pmai.in. The report on the workshop on particulate materials plant practice, Palghar, during Dec. 2009, will be published in the next issue of the News Letter. Design of PM components, a new set of guidelines for engineers who design or specify high performance pressed and sintered parts is expected to be available by 2011. On behalf of PMAI I wish all members happy & prosperous new year 2010.*

**P.Ramakrishnan**

## INTERNATIONAL CONFERENCE & EXHIBITION

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

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

Organized by : Powder Metallurgy Association of India

PMAI



### PMAI Awards

PMAI is happy to announce that from this year onwards there will be two awards for best paper presented during the annual technical meeting of PMAI. One of the Award is being supported by one of our active member Mr. N.Nagarjuna currently Vice President Technology, North American Hoganas

### Best Paper Awards

1. 'Prof. G. S .Tendolkar Best Paper Award' for work in sintering theory and practice
2. 'PMAI Best Student Paper award' for industrial research work

Both these awards will carry cash award of Rs.10, 000, a certificate and a memento.

In order to qualify for the awards the manuscripts of the paper must reach the PMAI office by 30th December 2009.

The manuscript should be prepared strictly in accordance with the guidelines.

You are therefore requested to submit the abstracts by 15th December 2009 and the manuscript by 30th December 2009.

### Best Industrial Product Award

PMAI award will be given to the best conventional and non-conventional PM products developed indigenously. The products should be displayed at the time of the 36<sup>th</sup> annual technical meeting along with one page write-up on the speciality of the product, the process and users. Photograph of the product & write-up should be sent in advance.

### For Further Details, Contact Us :

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**Powder Metallurgy Short Course 2009**

The short course in powder metallurgy offered by Powder Metallurgy Association of India (PMAI) was conducted this year by the Nonferrous Materials Technology Development Centre (NFTDC), Hyderabad during the week August 17-21, 2009. The course was designed to provide an in-depth knowledge of the range of powder metallurgy technology for practicing powder metallurgists and other engineers, managers, executives, academicians and entrepreneurs. There were over thirty participants, representing twenty industry and business organisations and five R&D organisations. The course was inaugurated by Mr P N S Sivan, President PMAI and by Dr K Balasubramanian, Director NFTDC. The mornings on all five days were devoted to lectures, while in the afternoons the participants were taken to visit PM activities in different organisations. Specialists dealt with different aspects of PM in the following lectures:

1. Overview of Powder Metallurgy	<i>Dr R Sundaresan, NFTDC</i>
2. Powder Production by Atomization	<i>Dr K Krishna Rao, Consultant</i>
3. Powders & Powder Characterisation	<i>Dr R Sundaresan, NFTDC</i>
4. Compaction of Powders: Theory and Application	<i>Prof. J Viplava Kumar, MGIT</i>
5. Die compaction and compaction equipment	<i>Mr J S Sachdeva, Newmet Pvt Ltd</i>
6. Solid State Sintering	<i>Dr Palanki Balakrishna, NFC (Retd)</i>
7. Sintering Furnaces	<i>Mr V. Raghunathan, Fluidtherm</i>
8. Processing of Ceramics	<i>Dr Sarika Mishra, NFTDC</i>
9. Metal Matrix and Ceramic Matrix Composites	<i>Dr V Bhanu Prasad, DMRL</i>
10. Hot Isostatic Pressing	<i>Dr Appa Rao, DMRL</i>
11. Powder Injection Moulding	<i>Dr M Vijay Kumar, DMRL</i>
12. Powder Applications in Surface Engineering	<i>Dr R M Mohanty, NFTDC</i>
13. Magnetic Materials	<i>Dr V Chandrasekharan, DMRL</i>
14. Processing and Application of Diamond Tools	<i>Dr K Muri Gopal, IMCO Alloys</i>
15. Friction Materials	<i>Dr T R Rama Mohan, Consultant</i>
16. Electrical Contact Materials	<i>Dr T R Rama Mohan, Consultant</i>
17. Powder Metallurgy of Gold	<i>Dr T R Rama Mohan, Consultant</i>
18. Porous Materials	<i>Dr R Sundaresan, NFTDC</i>
19. Cemented Carbides	<i>Dr R Sundaresan, NFTDC</i>
20. Management of Technology	<i>Dr K Balasubramanian, NFTDC</i>

**34 participants attended the course**

NAME	COMPANY
1 Mr Rajeev Girimaji	Abrasive Technologies Private Ltd, Bangalore 560 013
2 Mr Jaidev K Shah	Anticorrosive Equipments Pvt. Ltd., Valsad 396 035. Gujarat
3 Mr Chetan Sinroja	Anticorrosive Equipments Pvt. Ltd., Valsad 396 035. Gujarat
4 Mr Manoj Kathe	Avis Machines Pvt Ltd, Surat 395 008
5 Mr B Pravin Khumar	Balaji Diamond Tools, Coimbatore 641 045.
6 Mr G D Vaidya	Bhabha Atomic Research Centre, Mumbai 400 085
7 Dr Y Purushotham	Centre for Materials for Electronics Technology, Hyderabad 500 051.
8 Mr Ashutosh Panchal	Defence Metallurgical Research Laboratory, Kancharbagh, Hyderabad 500 058.
9 Mr Vijay Pal Shivran	Defence Metallurgical Research Laboratory, Kancharbagh, Hyderabad 500 058.
10 Mr Sanjiv Kumar Kuchiya	G K Micrometals Pvt Ltd, Gwalior 474 002 (MP)
11 Mr Vineeth Chama	Global Sinter Products (P) Ltd., Hyderabad 500076.
12 Mr S Vijay Kumar	Glowtronics Private Limited, Mysore 570018.
13 Ms Aayushi Mehta	Grishma Special Materials, Mumbai 400 064.
14 Mr K Saibabu	Innomet Powders, Hyderabad
15 Mr K Jayasankar	Institute of Minerals & Materials Technology, Bhubaneswar 751 013
16 Mr Praveen Goyal	Laxmi Narayan & Sons, Mumbai 400063.
17 Mr Atul Goyal	Laxmi Narayan & Sons, Mumbai 400063.
18 Mr Santanu Saha	MIDHANI, Hyderabad 500 058.
19 Ms A Vasantha	Nonferrous Materials Technology Development Centre, Hyderabad 500 058.
20 Ms Rati Ranjana	Nonferrous Materials Technology Development Centre, Hyderabad 500 058.
21 Mr Rajesh Sankhula	Nonferrous Materials Technology Development Centre, Hyderabad 500 058.
22 Mr M Ramakrishna	Nuclear Fuel Complex, Hyderabad 500 062.
23 Mr Jobin Koshi	Nuclear Fuel Complex, Hyderabad 500 062.
24 Mr L Vimal Ravikumar	Nuclear Fuel Complex, Hyderabad 500 062.
25 Mr N Prabakaran	Rane Brake Linings Ltd, Hyderabad
26 Mr D K Shastri	Rapicut Carbides Limited, Ankleshwar 393 002
27 Mr A C Gandhi	Rapicut Carbides Limited, Ankleshwar 393 002
28 Mr Shashank Kunde	Shatul Engineering Industries, S. Goa
29 Mr Rohit S Iyer	Sintbush (India) Pvt. Ltd., Mumbai 400004.
30 Mr Arun Shivraj	Specialty Sintered Products Pvt Ltd, Pune
31 Mr Doris Mehta	Shubhmets, Mumbai 400 097.
32 Dr Nagesh Kini	Thermax Limited, Pune 411 019.
33 Dr N Selvakumar	Thermax Limited, Pune 411 019.
34 Mr Nitin Gupta	Vasundhra Sintered Pvt Ltd, Delhi 110 042



The participants were also taken on visits to the molybdenum plant at MIDHANI; PM plant, powder injection moulding and hot isostatic pressing at DMRL; and molybdenum powder synthesis facility, surface engineering, microwave processing, design and precision applications and characterisation facilities at NFTDC.

Certificates were issued to the participants. They were also provided with soft copy of the notes of the lectures. The feedback from the participants was positive.



Participants with eminent speakers who delivered lectures during the course



## Design PM Components

"The project **A new set of guidelines for engineers and others who design or specify high performance pressed and sintered PM parts is on the road to publication in 2011. With financial backing from, among others, Swedish powder metal giant Höganas and the Swedish Government, assistant professor Roland Stolt is heading a two year project at the School of Engineering of the University of Jönköping in southern Sweden.**

The aim is to complement, rather than compete with the Global PM Property Database, first published three years ago after an unprecedented co-operative effort between the European Powder Metallurgy Association, the Japan Powder Metallurgy Association and America's Metal Powder Industries Federation.

However, Dr Stolt said: "The PM database and e-learning resource do not address how to find and specify the requirements of the PM part being designed. Depending on how the manufacturing process is carried out, the resulting properties can differ greatly from those found in the PM database.

"It is important, therefore, not only to specify the material and the minimum required density on the design drawing, but also to include all the properties needed for the part to serve successfully without unexpected failures.

The guidelines are expected to serve as an aid to structure a part's specification process so that no important properties are overlooked, he said. "The intention is to address only steel parts in high performance applications where wear-and-tear is an important issue will cost  $\square$ 200 000 over its two-year course.

Designing and specifying parts for manufacturing by powder metallurgical pressing and sintering process is challenging. There are many factors that influence the end result encompassing the geometry of the part, the selection of sinter steel, how the part is pressed, sintered and treated. The property values found in sinter steel material tables are nominal and may vary within wide ranges in the ready product depending on how it has been processed. It is therefore of utmost importance that the requirements on the part are successfully communicated to the manufacturer. When sourcing a powder metallurgical part, often only the material the required density and possibly how it should be treated is stated on the drawing. Due to the strong influence on the properties by the process route and processing parameters, this may not suffice. Instead the starting point when making the specification should be the requirements. This research project seek to establish concrete guidelines for finding the requirements on powder metallurgical parts in various applications and specifying them in an communicable way. This will ensure that important aspects are not overlooked in the design process. The customer can then be more confident that the part will be able to serve in the intended application, without any unexpected failures. The manufacturer will have a better chance to plan and run the process so that parts with the required properties are manufactured.

## Forthcoming PM Events

### INTERNATIONAL CONFERENCE 7 EXHIBITION ON POWDER METALLURGY PROCESSES OF PARTICULATE MATERIALS AND PRODUCTS & 36<sup>TH</sup> ANNUAL TECHNICAL MEETING

January 28-30, 2010, Jaipur, Rajasthan, India [www.pmai.in](http://www.pmai.in)

### MIM2010: INTERNATIONAL CONFERENCE ON INJECTION MOLDING OF METAL, CERAMICS AND CARBIDES

March 28-31, 2010, Long Beach, Ca USA [www.mpif.org](http://www.mpif.org)

### POWDERMET2010: MPIF/APMI INTERNATIONAL CONFERENCE ON POWDER METALLURGY & PARTICULATE MATERIALS

June 27-30, Hollywood Fort Lauderdale FL, USA [www.mpif.org](http://www.mpif.org)

### PRICM7

7<sup>th</sup> Pacific rim international conference on advanced materials and processing  
August 1-5, 2010 Cairns, Australia

<http://www.materialsaustralia.com.au/scripts/cgiip.exe/WService=MA/ccms.r?pageid=19070>

### ILASS 2010

23<sup>rd</sup> annual conference on liquid atomization and spray systems  
September 6-8, 2010, Brno, Czech Republic <http://www.ilasseurope2010.org>

### TITANIUM 2010

October 3-6, 2010 Orlando, FL USA [www.titanium.org](http://www.titanium.org)

### PM2010 WORLD CONGRESS

10 Oct 2010 - 14 Oct 2010, Florence, ITALY [www.epma.com/pm\\_2010](http://www.epma.com/pm_2010)

### Materials Science & Technology 2010 Conference & Exhibition

October 17-21, 2010 | Houston, Texas [www.matscitech.org](http://www.matscitech.org)

## WORKSHOP ON PLANT PRACTICE

### WORKSHOP ON PARTICULATE MATERIALS PLANT PRACTICE (PMP2)

December 2 3, 2009

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

Powder Metallurgy Association of India is organizing a two day workshop on Dec2-3, 2009 at Jungle Resort, Palghar. The aim of the workshop is 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 workshop is of two days duration from 2nd to 3rd December 2009. While morning sessions will be devoted to the lectures on applied aspects of PM technology, the afternoon sessions will be an in plant training at M/S Sintbush India Ltd. on operations such as blending, compaction, sintering, secondary operations and characterization of powders and evaluation of sintered components. These 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.

## PMAI Publication

PMAI has published transactions of PMAI Vol.35.

- 1. PRODUCTION OF Al-Cu-Mg ALLOY THROUGH MECHANICAL ALLOYING-CERTAIN OBSERVATIONS**  
K. Gururaj, KITS Warangal, G. Poshia
- 2. SYNTHESIS AND CHARACTERIZATION OF CNT REINFORCED AI-BASED COMPOSITE POWDERS BY HIGH ENERGY BALL MILLING**  
M. S. Senthil Saravanan, S. P. Kumaresh Babu, K.Sivaprasad
- 3. ULTRA PURIFICATION OF CADMIUM FROM INDIAN RESOURCE: SOME STUDIES**  
D. S. Prasad, N. R. Munirathnam, N. Mural Babu, T. L. Prakash
- 4. PREPARATION OF HIGH PURITY SUB- MICRON SPHEROIDAL ZIRCONIA POWDER FROM IMPURE ZIRCONIUM SALT THROUGH GLYCEROL ROUTE**  
Amit Sinha, P. K. Sinha, B. P. Sharma
- 5. HYDROSTATIC BEHAVIOUR OF REACTION MEDIUM ON THE SYNTHESIS OF ZINC OXIDE NANO PARTICLES**  
S.P. Ansari, A.H.Ansari, E.Mohammad
- 6. EFFECT OF COMPOSITION AND SINTERING ATMOSPHERE ON PHASE BALANCE OF P/M DUPLEX STAINLESS STEELS**  
R. Mariappan, S. Kumaran, T. Srinivas Rao, V. Muthipandi
- 7. INFLUENCE OF CARBON CONTENT ON WORKABILITY BEHAVIOR OF POWDER METALLURGY STEELS**  
R.Narayananasamy, V.Anandkrishnan, S.Sivasankaran, K.Siva Prasad, K.S.Pandey
- 8. STUDIES ON MICROSTRUCTURE AND MECHANICAL PROPERTIES OF VACUUM SINTERED STAINLESS STEELS**  
R. Mariappan, S. Kumaran, T. Srinivasa Rao, S.B. Chandrasekar
- 9. STUDIES ON LEAD FREE NANO Ba(0.9)Sr0.1 Ti O3 FERROELECTRIC CERAMICS: SYNTHESIS, CHARACTERIZATION AND PROPERTIES**  
M. Venkat Ramana, V.R.K. Murthy, B.S.Murty
- 10. DRY RECYCLING OF REJECTED MOX FUEL PELLETS IN MOX FUEL FABRICATION FOR PFBR:**  
B.Surendra, M.K.Yadav, A.K.Mishra, Mohd Afzal, J. P. Panakka
- 11. STUDIES ON AA 6061-FLY ASH COMPOSITES PRODUCED BY PRESS AND EXTRUSION APPROACH**  
P.R.S.Kumar,S.Kumaran,T.Srinivasa Rao,



International Conference with Trade Exhibition

# **INTERNATIONAL CONFERENCE & EXHIBITION**



**On**

**Powder Metallurgy in Processing of Particulate Materials and Products**

**& 36<sup>th</sup> ANNUAL TECHNICAL MEETING**

**Jaipur, 28th to 30th January 2010**

### 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 and process equipments
- Materials and components for aerospace, defence and 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.

### Conference Venue

**Sheraton Rajputana Palace Hotel, Jaipur**



An ITC-Welcomgroup Hotel With Sheraton International Inc.  
Palace Road,  
Jaipur-302006 India

Tel: + 91-141-5100100 FAX: +91-141-5100102  
[www.itcwelcomgroup.in/hotels/sheratonrajputana.aspx](http://www.itcwelcomgroup.in/hotels/sheratonrajputana.aspx)

### Deadlines

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

**For Further Details, Contact Us :**

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