



# POWDER METALLURGY ASSOCIATION OF INDIA

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## Contents

- International Conference PM 23
- PMSC 22
- PM Products- Tool Design Process
- Heat Treatment of PM Parts

## Editorial Board

Editor: P. Ramakrishnan  
Emeritus Prof. IIT(B)

## Members:

Aniket Gore  
Deep Prakash  
K. Murli Gopal  
K. S. Samant

## PMAI Office:

102, Anandi, 1st Floor,  
M.B. Raut Road, Shivaji Park, Dadar,  
Mumbai - 400028, India  
Tel: +91 9820951180 / 9821111677  
E-mail: [info@pmai.in](mailto:info@pmai.in)  
URL: [www.pmai.in](http://www.pmai.in)

## Editorial

As the pandemic recedes, PMAI is gearing up for re-initiating our Physical Initiatives and Engagements.

We will kick off events with our Powder Metallurgy Short Course, which we have been conducting in Partnership with COEP Pune over the past several years. The course will be held from 21 - 24 September 2022 at COEP Pune.

The Popular PM Tool Design Workshop will be held at COEP Pune between 8 to 10 November 2022. The course will be conducted by Mr. Sanjay Rastogi. Mr. Rastogi has vast experience and expertise in the PM Field, having retired as Director Engineering - GKN Sintermetals.

We are very happy to introduce a new course titled Heat Treatment of PM Parts. This course will be held from 9 - 10 December 2022 at College of Engineering Pune, and will be spearheaded by Mr. Narsi Chandrachud, whose immense experience will greatly benefit participants. The course will present a comprehensive overview on the objectives and types of heat treatment, pros and cons of equipments used for the same as well as utilisation of heat treatment for tool steels.

Calendar Year 2023 will be a busy one with a number of activities planned. We will update the same in due course.

P. Ramakrishnan

1st ANNOUNCEMENT & CALL FOR PAPERS



# PM 23

## INTERNATIONAL CONFERENCE ON POWDER METALLURGY

AND

## 48<sup>th</sup> ANNUAL TECHNICAL MEETING OF PMAI

Conference Language is English

On

13<sup>th</sup> to 15<sup>th</sup> March 2023

Venue

Hotel  
The Lalit Sahar  
Airport Road,  
Andheri (East),  
Mumbai-400059,  
India

Details & online registration  
at [www.pmai.in](http://www.pmai.in)

# NEWSLETTER

# PMSC 22

Online Mode



## Powder Metallurgy Association of India

[www.pmai.in](http://www.pmai.in)

**21<sup>th</sup> – 24<sup>th</sup> September, 2022**

### Short Course in Powder Metallurgy (PMSC 22)

PMSC has an extensive curriculum covering the complete portfolio of Powder Metallurgy (PM) technologies. Participants will acquire a fundamental understanding of the science & practice of PM as well as the breadth of the subject.

***It will be offered through digital mode using suitable cloud platform.***

Participants will be required to undergo online test on the content taught in the course for knowledge acquired and will be issued a certificate by PMAI. Participation is restricted to 60, first come first served.

#### The course is useful for:

- Line Executives & Project Managers
- Maintenance & Process Engineers
- Application Development Engineers
- Materials Research Scientists / Engineers
- Consultants
- Teaching & Research Faculty
- Students

#### Takeaways

- Good understanding of all PM technologies & processing techniques
- Clarity on & selection criteria for technologies & materials for different applications
- Understanding of material degradation
- mechanisms under different working environments
- Illustration of and guidelines for successful product development
- Product characterization and performance evaluation methods
- Introduction to manufacturing standards

#### Topics

- Powder Production
- Characterization of Powders
- Consolidation of Powders
- Design and Fabrication of Dies and Tooling
- Sintering
- Characterization and Evaluation of Sintered Components
- Powder Injection Molding (MIM + CIM)
- Sintering Furnaces and Atmospheres
- Heat Treatment & other downstream processes & equipment
- Quality in PM Manufacturing
- Porous PM Materials
- Advanced Ceramics and Composites
- Aerospace and Defense Materials
- PM in Nuclear Engineering and Energy Generation
- PM in Bio Materials
- Friction Materials
- Additive Manufacturing (3D printing)

#### Faculty

A judicious mix of experts from industry and academia comprise the faculty for PMSC 22.

#### Note to Participants:

For good quality reception of online lecture through suitable cloud platform, you are requested to ensure that throughout the sessions there is adequate bandwidth of internet, workable and tested audio system (viz. ear phone, head phone, etc.) at your end. Please ensure that your seating place is having simple background and is free from disturbance / noise. Otherwise, it may disturb you as well as the speaker during this online mode of interaction.



COEP Tech

**Powder Metallurgy Association of India**

[www.pmai.in](http://www.pmai.in)

**PM PRODUCTS - TOOL DESIGN PROCESS**

**8<sup>th</sup> - 10<sup>th</sup> NOV 22**



COEP TECH

The Powder Metallurgical Association of India, an association of Indian and overseas PM professionals from the industry, research laboratories and academia is conducting a three-day course on Tool Design Process for PM Products in offline mode at Dept. of Metallurgy and Materials Science, COEP Technological University (Unitary Public University of Govt. of Maharashtra) Pune-411005. The course presents in-depth overview of compaction process and design of tools for new and prospective entrants to the PM product design and existing PM components manufacturers.

### PROGRAM SCHEDULE

Time	Day 1 (8th NOV 22)
09:00-10:00	Basics of powder Metallurgy & Compaction
10:00-10:15	Tea Break
10:15-11:00	Basics of Sintering & Secondary Operations
11:00-13.15	Compaction – Fundamentals
13.15-14:00	Lunch Break
14:00-15:30	Compaction – Interrelation between Product & Tool Design
15:30-15:45	Tea Break
15:45-16:30	Compaction – Interrelation between Product & Tool Design (Contd..)
16:30-17:30	Exercises
Time	Day 2 (9th NOV 22)
09:00-11:00	Tool Friction & M/Q Ratio
11:00-11:15	Tea Break
11:15-13:15	Elasticity of tools & product quality
13.15-14:00	Lunch Break
14:00-15:00	Effect of magnetism on pressing process
15:00-15:15	Tea Break
15:15-16:00	The adapter as link between tool and press
16:00-17:30	Exercises

Time	Day 3 (10th NOV 22)
09:00-11:00	Tool Design Process – Product to tool
11:00-11:15	Tea Break
11:15-13:15	Tool Design Exercise
13.15-14:00	Lunch Break
14:00-15:00	Tool Design Process – General Assembly
15:00-15:15	Tea Break
15:15-16:00	Tool Design Exercise
16:00-17:30	Final Question & Answers / Concluding Remarks

#### Registration Fees: 5000/-

Registration details Name, Designation, Organization, Phone, Email along with Proforma tax invoice of payment details must send to [director@pmai.in](mailto:director@pmai.in)

All communication may address to [director@pmai.in](mailto:director@pmai.in), Unit 401, K Square, P.K. Shroof Road, Near Union Bank, Baner, Pune - 411045, India



#### About Speaker: Sanjay Rastogi

A 1987 graduate in mechanical engineer from NIT Allahabad (U.P). He has more than 35 years of experience in automotive industry out of which 30 years in PM. He has worked with Indian and Multinational companies like Sundaram Fasteners, Federal Mogul, GKN Sinter Metals, covering areas of Product Development, Manufacturing Engineering, Quality Management, Tool Manufacturing, Operations, Sales, and Business Development. In his last role at GKN as Director Engineering was responsible for engineering function including tool manufacturing for Indian and South African Operations.



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## **“HEAT TREATMENT OF PM PARTS”**

**9<sup>th</sup>- 10<sup>th</sup> Dec 22**



The Powder Metallurgical Association of India is conducting a Two-day course on "Heat Treatment of PM parts" in offline mode at Dept. of Metallurgy and Materials Science, COEP Technological University (Unitary Public University of Govt. of Maharashtra) Pune- 4110 05 (India). The course presents a technology overview for new and prospective entrants to the PM.

### **PROGRAM CONTENT**

#### **Heat Treatment of PM parts:**

1. Introduction to Powder Metallurgy (Brief description of PM Process to understand the presence of pores and it's relation to the post sinter treatments like electro plating, heat treatment, welding etc.)
2. Why heat treatment? Improvement in static and dynamic strength, relevance to microstructure
3. Heat Treatment basics
4. Theory of Quenching – Quenchants for PM Parts - Oils and polymers – Quench speed measurements
5. Types of heat treatments and their objectives mainly related to PM parts – Quench and temper, case hardening, nitriding – furnace atmospheres, induction hardening (selective) –All in relation to PM Parts
6. Steam treatment – Basics and process
7. Heat treating furnaces. Advantages / disadvantages of batch type versus continuous furnaces
8. Heat treated properties measurement of PM Parts – Understanding microstructures
9. Tool steels and heat treatment

#### **Registration Fees: 5000/-**

Registration details Name, Designation, Organization, Phone, and Email along with Proforma tax invoice of payment details must send to [director@pmai.in](mailto:director@pmai.in)

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#### **Lead Speaker: N. L. Chandrachud**

- BE Metallurgy from COEP Pune in 1974 and M.Tech Metallurgical Engineering from IIT Bombay in 1976
- Senior Scientific Officer at DMRL, Hyderabad for about 2 years
- Manager- Metallurgy for about 16 years at Telco (Tata Motors) Pune
- General Manager- Materials Engineering at Cummins India, Pune for about 10 year
- Executive Vice President at GKN Sinter Metals, Pune for about 12 years
- At present- Consultant to GKN-Hoeganaes Corporation, USA
- Past Vice President of PMAI and Fellow PMAI
- At present Member - Governing Council, PMAI