



# POWDER METALLURGY ASSOCIATION OF INDIA

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## Editorial

Dear Friends,

As we celebrate our Golden Jubilee Year, we have a packed calendar of activities.

We kicked off our PMAI Courses with a new, very important course on Industrial Plant Safety. The Virtual One day course was held on 12 July 2023. We were fortunate to have Mr. Khadse, an expert with decades of experience, who guided participants about the nuances related to ensuring Industrial Safety.

In Q4 2023, we have a busy lineup of courses.

- Our popular Online PM Short Course, to be held between 3 and 6 October 2023.
- Our Annual PM Tool and Design Process Online course, to be held between 17 and 18 October 2023.
- Our Annual Heat Treatment of PM Parts Course, held in Hybrid Mode (COEP + Online) on 8, 9 December 2023.

We are also gearing up for our Golden Jubilee International Conference PM24, to be held 25 to 28 February 2024. We will share more updates concerning the preparations by December 2023.

We wish you all good health and success for the coming days.

Aniket Gore

**50** GOLDEN JUBILEE CELEBRATIONS  
*years of PMAI*

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

**PM 24**

**INTERNATIONAL CONFERENCE ON POWDER METALLURGY  
AND PARTICULATE MATERIALS WITH SHOW CASE EXHIBITION  
49<sup>TH</sup> ANNUAL TECHNICAL MEETING OF PMAI**

**Date : 25th February 2024 to 28th February 2024**

**Venue : HYATT REGENCY, PUNE HOTEL & RESIDENCES,  
Weikfield IT Park, Nagar Road, Pune, India, 411014**

**NEWSLETTER**

# Report on NEW PMAI TRAINING PROGRAM: INDUSTRIAL PLANT SAFETY

Powder Metallurgy Association of India conducted a One day Online Training Program elaborating the best Plant Safety Practises for the PM Industry on 12th July 2023.

Industrial Plant Safety is a Critical Aspect of PM Plant Operations. Plant Safety is critical to ensure prevention of damage to Plant and Safety of Personnel from Industrial Accidents. Good Plant Safety Protocol and Practise also ensures that unforeseen financial Losses are prevented



The Program was conducted by Mr. Shrikrushna Khadse, our Expert Faculty who has a B.E. in Electrical Engineering, Advanced Diploma in Industrial Safety and Diploma in Fire Engineering from

Nagpur: An Authorised Safety Auditor and Competent Person under Factory Act (Maharashtra Government). Mr.Khadse is an accredited Safety Auditor and Lead Auditor for ISO 14001 & ISO 45001 Standard. He has experience in training, coaching, facilitation and auditing on topics of Occupational Health & Safety Management, Incident Management, Process Safety Management & Industrial Safety Digitalisation. Mr. Khadse has rich experience of more than 24 years of Industrial Safety in varied industries such as Powder Metallurgy, Power Generation, Leather Dyeing and Consumer Appliances. He has worked with reputed companies such as Tata Power, LG Electronics and Reliance Industries. Since 2010, Mr. Khadse is working as Senior Manager - HSE, with GKN Sintermetals Pimpri, Pune. The course was well received by PM fraternity.

## Training Program Content:

1. Industrial Safety
  - a. Basic Safety
  - b. Risk Assessment (HIRA)
  - c. Near miss and Accident Preventions
  - d. Safety Committee and Safety Co-Ordinator
  - e. Best Practices on Safety
2. Fire Safety
  - a. Basic fire
  - b. Fire Triangle
  - c. How to use Fire Extinguisher
  - d. Fire Hydrant & System
3. Statutory Requirement pertaining to Occupational Safety and Health
  - a. The Factories Act, 1948 & Maharashtra Factory Rules 1963
  - b. Environment The water, Air and the Hazardous & Other Wastes
  - c. Maharashtra Fire Prevention and Life Safety Measures Act
4. Behavior Based Safety (BBS) Management & coaching
  - a. BBS Principles
  - b. ABC Technique
  - c. BBS Process Flow
  - d. Analyzing Exercise
5. Open Discussions.



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**PMSC 23**  
**(Online Mode)**

**3<sup>rd</sup> - 6<sup>th</sup> October 2023**

## Short Course in Powder Metallurgy (PMSC 23)

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 23.

### 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.



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# PM PRODUCTS - TOOL DESIGN PROCESS

17<sup>th</sup> - 18<sup>th</sup> October 2023 (Online Mode)

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 (17th October 23)
09:30-10:30	Basics of Powder Metallurgy ➤ Powder, Compaction & Sintering
10:30-11:15	Compaction – Fundamentals
11:15-11:30	Tea Break
11:30-13:15	Compaction – Fundamentals Contd...
13:15-14:00	Lunch Break
14:00-15:30	Compaction – Interrelation between Product & Tool Design
15:30-15:45	Tea Break
15:45-17:15	Tool Friction & M/Q Ratio
17:15-18:00	Exercises

Time	Day 2 (18th October 23)
09:30-11:30	Elasticity of Tools & Product Quality
11:30-11:45	Tea Break
11:45-13:15	Tool Design Process – Product to Tool
13:15-14:00	Lunch Break
14:00-15:30	Tool Design Exercise
15:30-15:45	Tea Break
15:45-16:45	Tool Design Process – General Assembly
16:45-17:30	Exercises
17:30-18:00	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). Registration and online payment can also be done at [www.pmai.in](http://www.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”

**8<sup>th</sup>-9<sup>th</sup> Dec 23**

The Powder Metallurgy Association of India (PMAI) is conducting a Two-day course on “Heat Treatment of PM parts” in hybrid mode (Physical + online at same time) in collaboration with Dept. of Metallurgy and Materials Science, COEP Technological University (Unitary Public University of Govt. of Maharashtra) Pune. The course presents a technology overview for new and prospective entrants to the PM. Those who desire to attend and interact with faculties in person can do so by reaching the Board Room at Dept. of Metallurgy and Materials Science, COEP Technological University, Shivajinagar, Pune. Participants attending online will be provided the course link a day in advance to join the course. Registration for the course may be done by visiting our website [www.pmai.in](http://www.pmai.in) or by writing email to [director@pmai.in](mailto:director@pmai.in)

## PROGRAM SCHEDULE

Time	DAY 1 (8 <sup>th</sup> Dec, 2023)	DAY 2 (9 <sup>th</sup> Dec, 2023)
10:00-12:00	<b>SPEAKER: N. L. CHANDRACHUD</b> Introduction to Powder Metallurgy (Brief description of PM Process to understand the presence of pores and its relation to the post sinter treatments like electro plating, heat treatment, welding etc.)	<b>SPEAKER: N. B. DHOKEY</b> Heat treatment of tool steels; Hardening and salt bath treatment; multiple tempering; microstructure and hardness, applications to dies and tooling.
12:00-12:15	TEA BREAK	
12:15-13:15	<b>SPEAKER: N. L. CHANDRACHUD</b> Why heat treatment? Improvement in static and dynamic strength, relevance to microstructure Property measurement of PM parts– Understanding microstructures.	<b>SPEAKER: S. MENAVLIKAR</b> Furnace in relation to the thermal processing of metals, Batch type furnaces and continuous furnaces, Type of commonly used furnaces today for heat treatment and the details.
13:15-14:15	LUNCH BREAK	
14:15-16:15	<b>SPEAKER: N. L. CHANDRACHUD</b> Theory of Quenching – Quenchants for PM Parts - Oils and polymers – Quench speed measurements; Types of heat treatments and their objectives mainly related to PM parts – Quench and temper.	<b>SPEAKER: S. MENAVLIKAR</b> Furnace protective atmospheres, Generation of atmosphere in furnace, Furnace instrumental and manual controls, Cryogenic treatments (Tool steels and high alloy PM parts).
16:15-16:45	(Q and A Session)	(QA and Closing Session)

### 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)

*All communication may address to*

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Unit 401, K Square, P.K. Shroff Road,  
Near Union Bank, Baner, Pune - 411045, India

## SPEAKERS



**Mr. N. L. Chandrachud**

- BEMetallurgy from COEP Pune in 1974 and M.Tech Metallurgical Engineering from IIT Bombay in 1976
- Senior Scientific Officer at DMRL, Hyderabad for about 2years
- 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



**Mr. Sandeep Menavlikar**

- Total 32+ years of rich experience in Heat treatment manufacturing, Customer & Supplier Relationship Management Quality Control; Process Improvement, New Product Development /CRM, catering to all OEMs industry in India and abroad.
- Expertise in using PPAP, Poka-Yoke, Kaizen, Why-Why Analysis, CAPA Tools at supplier end for NPD; source change while adhering to TS16949 standards; structured processes /internal control plans for manufacturing operations.
- Proven acumen in implementing CQI-9standard; procedures; catering to all OEMs industry in India and abroad.
- Expertise in managing various operations involving resource planning, materials planning, Lab inspection, team building and co-ordination with the internal departments.



**Dr. N B Dhokey**

- Professor, Metallurgy & Material Science Dept, COEP Tech Pune.
- Vice President of PMAI and Fellow PMAI
- Published more than 100 research articles in reputed national journals and international journals. He also published 4 patents and 2 book chapters.