



# POWDER METALLURGY ASSOCIATION OF INDIA

ISSN-0377-8452

SEPTEMBER-DECEMBER 2022

## Contents

- From Presidents Desk  
Transiting from 2022 to 2023:  
Challenges and Opportunities
- Report - PMSC 22
- Report - Course on PM Tool Design  
Process for PM Parts
- Report - Course on Heat Treatment of  
PM Parts
- Industry News
- Member Achievements

## Editorial Board

Editor: Aniket Gore  
President PMAI

## Members:

Deep Prakash  
Prakash Khole  
K. S. Samant

## PMAI Office:

401, K. Square, P. K. Shroff Road,  
Near Pre-Foundry School, Baner,  
Pune - 411045, India  
Tel: +91 9820951180 / 9821111677  
E-mail: [info@pmai.in](mailto:info@pmai.in)  
URL: [www.pmai.in](http://www.pmai.in)

## Editorial

Transiting from 2022 to 2023: Challenges and Opportunities: An article by PMAI President Aniket Gore, offers a brief overview of the Challenges the World faced in 2022, the Current China Covid Challenge, an overview of the Indian Macro Economic Forecast, Indian Automotive Sales in 2022 and last but not the least why Economic Opportunity in India continues to remain robust from a medium to Long Term View.

A summary of Courses Conducted by PMAI - PMSC 22 (21 to 24 September 2022), Tool Design for PM Parts (8 to 10 November 2022), Heat Treatment of PM Parts (9, 10 December 2022) is duly presented.

We conclude the newsletter with some Industry News and Member Achievements.

Aniket Gore



# PM 23

## INTERNATIONAL CONFERENCE ON POWDER METALLURGY

AND

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

On

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

Venue

The Lalit Mumbai

Airport Road, Andheri (East), Mumbai-400059, India

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

## TITLE SPONSORS



RioTinto

METAL POWDERS

# NEWSLETTER

## TRANSITING FROM 2022 TO 2023: CHALLENGES AND OPPORTUNITIES

Calendar Year 2022 has been an eventful and challenging year.

While COVID 19 restrictions eased across the world (with the exception of China), and provided a much required sense of normalcy to individuals in 2022, War, Inflation and Supply Shortages have continued to present formidable challenges.

The unexpected recovery of consumer demand in 2021 led to historic and broad supply shortages. In early 2022, the Russian Invasion of Ukraine was another unexpected black swan, and had a sharp upward impact on oil and gas, fertilisers and food prices. This has created sustained high inflation in 2022. As a result, central banks and governments have had to reverse their established low interest rate stance, and raise interest rates aggressively. The consequence of the aggressive rate hikes is that a global slowdown is imminent. Past precedent suggest that interest rates will fluctuate from medium to high levels, before settling down to levels that Central Bankers feel will induce moderate inflation which is ideal for sustained growth. In 2023 we should expect higher than normal levels of inflation. The other challenge for Central Banks and Governments will be to reverse the huge liquidity (estimated at 9 trillion USD) they have injected into global economies. This is not easy to implement.

### THE EMERGING COVID CHALLENGE: CHINA

Over the past few months, another major concern has emerged. China has reversed its Zero Covid Policy and is opening up fast at a time when their population has low levels of exposure to natural infection. As a result, China is currently reeling from a severe Covid Wave. The current circulating variants in China are Omicron which have evolved in vaccinated populations, and, are therefore, very infectious. This has resulted in a surge in infections to an estimated 37 million cases daily as on 25 December. Most of the Chinese population has received 2 vaccine shots, and the most commonly used vaccine is the AFAIK Vaccine produced by Sinopharm, China. This is an inactivated vaccine that works well to prevent severe disease / death. However, China's challenge will be similar to India. Even if a small percentage of population needs hospitalisation, this will put severe strain on their medical infrastructure. The accelerated rate of infections may mean that the Chinese may experience in days and weeks what we in India have experienced over several months.

The variants currently circulating in China have been in the rest of the world for months, and the behaviour of the virus is not any different from expected. The worry with China is not just the tragedy that is unfolding for its people, but the high levels of replication mean that there is increased opportunity for new variants to emerge, and spread globally.

At the moment, India is doing fine. We have had the XBB and BF.7 variants for a while now, and they have not driven any drastic increase in infections in India. In the absence of an even more highly infectious variant, we may not expect a surge. The general

advisory from eminent practising doctors in India is to consider active usage of masks and encourage booster shots for the elderly.

### INDIA: MACRO ECONOMIC FORECAST 2023:

In spite of the dependence on imported energy, reliance on foreign capital and a slowing global economy, GDP Growth in India is expected to be between 4.5 and 6% as per a broad Consensus Forecast.

Robust Government Spending on infrastructure, manufacturing boost aided by the Governments PLI scheme (manufacturing linked to import substitution may fare better, exports may face challenges), and a resilient services sector should support the case for GDP Growth. Key metrics to track will be interest rates, global growth recovery - which will help our exports, and our employment data.

### THE INDIAN AUTOMOTIVE SECTOR

Passenger Vehicle (PV) Makers have had a fairly good 2022. India's automakers are projected to end this calendar year with sales of 3.8 million PVs, exceeding the previous record by more than 400,000 vehicles, driven by sustained demand and improved component supplies that helped them ramp up production. Importantly, over 40% of sales in 2022 were for premium vehicles (priced at Million Rupees (12,000 USD) or more).

However, inflation and increasing interest rates could weigh on PV demand in 2023. Maruti Suzuki India Limited Chairman R C Bhargava tried to make a case for reducing taxes on petrol and diesel cars, which in his opinion would be a key factor to sustained high growth. The Finance Minister responded that a 28% tax on Petrol and Diesel Cars (Cars greater than 1500 cc and 4 metres in length) is prudent and reflects the Government's stance to encourage the Indian Consumer to shift to Electric Vehicles to Promote Fuel Economy and Energy Security.

Wholesale numbers for PV sales crossed the 300,000 mark for the sixth consecutive month in November, taking the cumulative tally to over 2 million vehicles, for the first time ever in a six month period. The estimated sales growth for this year is 23% which is coming on top of a 27% growth in 2021. Given the robust demand in the market, major PV manufacturers are planning CAPEX to the tune of Rs. 30,000 Crores (approx. 3.9 billion USD) over the next 2 years.

Here are some inputs from FADA (Federation of Automobile Dealer Associations):

3 Wheeler Registrations have also shown strong traction with over 569,000 units sold in India for the first 11 months of this Calendar Year - which is a 77% growth over corresponding period in 2021.

Tractor Registrations were at 620,000 units for the first 11 months of the calendar year – which is a 3% growth over the corresponding period in 2021.

2 Wheeler Registrations were at 13.2 million Units for the first 11 months of this Calendar Year – which marks an 18% growth over the previous year. It is important to track the penetration of 2 wheeler EV Sales. KPMG estimates that 2 wheeler EV Sales could cross the 1.5 million Mark in 2023.

Overall EV sales continue to show strong traction with registered new vehicles in India crossing the 1 million mark in 2022 which is more than 3x the sales in 2021.

#### **PMAI:**

For Powder Metallurgy Association of India, Calendar Year 2022 was a year packed with activities, as documented in our newsletters.

2023 is a milestone Golden Jubilee Year. It is a wonderful coincidence that we will take possession of our new office in Pune, as we commence our 50<sup>th</sup> year. We will occupy and start operating from our office in January 2023.

Apart from the International Conference which will be held from 13 to 15 March 2023, at The Lalit Mumbai, we will continue with launch of new courses and activities. Our website and newsletters will keep you updated.

#### **THE INDIA OPPORTUNITY:**

Inspite of the fact that there are many visible challenges globally, India is undergoing structural transformation at a rapid pace.

One concern that has been raised for sometime relates to the bottom 50% economic strata in India, and their ability to progress economically. India Stack, an innovation made in and for India, has been and will prove to be a boon to many million Indians over the coming years.

Aided by India Stack, we have created a Fintech wave and lifted 415 million people out of poverty in the past 15 years. Aadhar the biometric database has enrolled 1.26 billion Indians, and enabled Digital Payments and eKYC. UPI—the United Payments Interface –allows people to transfer money instantly with only biometric inputs. In F.Y. 2022, UPI processed 46 billion transactions (40% of all global transactions) amounting to INR 41 trillion. As data is generated via digital transactions, credit history of individuals or small enterprises can be tracked. The next logical step is digital lending – this is a critical step because micro enterprises are barred from access to credit, because they are too expensive for banks to service. Digitisation is bringing that cost down, making small value, short duration loans commercially feasible. This will benefit small enterprises immensely and transform their growth trajectories.

The Open Network for Digital Commerce (ONDC) is a network based on open protocol, and will enable local commerce across segments such as mobility, grocery, food order and delivery, hotel booking and travel, among others. The ONDC platform aims to create new opportunities, curb digital monopolies, by supporting micro, small and medium enterprises and small traders and help them get on online platforms.

What will happen as a result of the above is a much needed democratisation of access to markets and capital that will make entrepreneurship possible outside India's metros. We are blessed with a good demographic dividend. In any society jobs and prosperity are created by entrepreneurs. Entrepreneurs seize opportunities disguised as problems and find ways to solve them profitably.

The startup ecosystem in India is thriving. From a few thousand startups a decade ago there are over 75,000 today. The emergence of a large number of young entrepreneurs, about 50% of whom are not from the eight major metros is a heartening sign. The first wave of middle India Centric Innovation has predictably come in areas that matter to these consumers and small businesses – digital lending, payments, data centric agriculture solutions, digital vernacular content, rural e-commerce sectors etc. Sectors such as environment and climate change offer humongous opportunities going ahead.

Poverty alleviation, favourable geo political positioning, a large domestic market, a growing middle class and an imminent increase in manufacturing and services, all augur well for India. It is fair to conclude that the coming decade should be a very good one for us.

I would like to take this opportunity to wish all of you a very healthy, happy and prosperous 2023.

Stay safe and best regards,



#### **Aniket Gore**

*The data points and inputs presented in the article are all based on published material. Sources can be provided on request.*

*The author is an entrepreneur whose business supplies critical raw material and Capital Equipment to the Powder Metallurgy, Ceramic, Graphite and other Speciality Industries.*

*He is the Current President of the Powder Metallurgy Association of India.*

*He is also an active investor in Indian equities and companies in the start-up ecosystem in India.*

*He can be reached at [president@pmai.in](mailto:president@pmai.in)*

# Powder Metallurgy Short Course-22 (PMSC22)

21-24 September 2022

In Virtual Mode: Platform used: Microsoft Teams

A four-day short-term course on powder metallurgy (PM) "Powder Metallurgy Short Course-22 (PMSC22)" took place from 21-24 September 2022 in the virtual mode. The program was organized by PMAI in collaboration with Department of Metallurgy & Materials Science College of Engineering Pune and National Institute of Advanced Manufacturing Technology, Ranchi Campus. Dr. Vaishali Poddar (from NIAMT, Ranchi) and Dr. Vijay Thavale (from COEP Pune), Conveners – PMSC22 welcomed the participants and briefed about the workshop. Dr. Sandeep Butee, Head of Department, Metallurgy & Materials Science, COEP introduced various activities and happenings of the department to the people virtually present in the inauguration. Mr Aniket Gore, President, Powder Metallurgy Association of India gave introduction about PMAI and the activities housed under the flagship. Dr. Vaishali Poddar gave instructions for online mode of communication during PMSC22, and later Dr. Vijay Thavale proposed the vote of thanks. In this way, the inaugural function got concluded (online snap shown in Fig. 1). Invited talks covered various aspects of powder metallurgical technology. The multiple invited talks were delivered by eminent speakers and covered various powder metallurgy and its application related topics as tabulated in Table 1.

Table 1: Topics of the invited talks covered by various invited speakers at PMSC22.

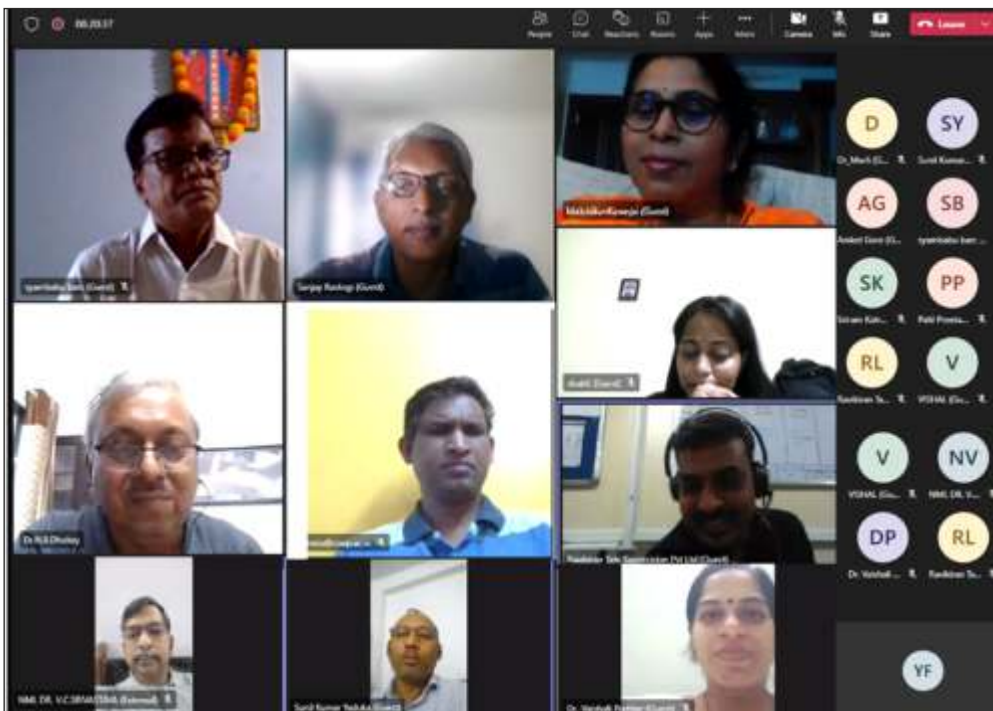
Sr. No.	Topic	Name of the Speaker
1	Overview of Powder Metallurgy and Particulate Materials Technology	Mr. N.L.Chandrachud, Consultant
2	High Density, High Performance PM Materials Processing	Mr. N. L. Chandrachud, Consultant
3	Maintaining Quality in PM Manufacturing	Mr. Rajendra Sethiya, GKN
4	Mechanical and Solution Methods of Powder Production for PM	Dr. K. Murli Gopal, Novoken Innovations
5	Commercial Iron powder technology: manufacturing, characterization & applications	Mr. M. Nipanikar, Hogan India
6	Powder Characterization	Dr. Vaishali Poddar, NIAMT, Ranchi
7	Design and fabrication of Tooling for PM	Mr. Sanjay Rastogi, Consultant
8	Consolidation of Powders: Binders, Lubricants & Sintering Aids	Dr. Syam Babu, BARC
9	Fabrication / Shaping Methods for Advanced Ceramics and Composites	Dr. Deep Prakash, BARC
10	Thermal Methods of Powder Production for PM	Dr. Tarashankar Mahata, BARC
11	Thermal Consolidation of Powders- Sintering Fundamentals	Dr. N.B. Dhokey, CoEP
12	Furnaces for sintering & heat treatment	Mr. Girish Chintawar, Fluidtherm
13	Sintering of Some Commercial Ceramics	Dr. S. P. Butee, CoEP
14	Surface Engineering of PM Components	Dr. Dattatraya Karandikar, SPRAYMET
15	PM parts Heat Treatment	Dr. N.B. Dhokey, CoEP
16	PM Porous Materials	Dr. K. Murli Gopal, Novoken Innovations
17	Bio-materials	Dr. Malobika Karanjai, ARCI
18	Bond Matrices in Diamond cutting tools	Dr. Vivek Singhal, Sharp Diamond
19	Spray Forming and Powder Production	Dr. Vikas C. Srivastava, NML Jamshedpur
20	Additive Manufacturing and PM	Dr. Deepak Pattanayak, CSIR-CECRI
21	Friction Materials	Dr. Malobika Karanjai, ARCI
22	Emerging Alloys in PM	Dr. Bharat Panigrahi, IIT Hyderabad
23	Metal Injection Molding	Dr. Vijay Thavale, COEP
24	Overview of PM Standards	Dr. Kaustubh Kambale, COEP



Each session comprised of dedicated discussions, challenges and opportunities in powder metallurgy technology development. Overall, there were about 11 participants attending this course which were drawn from diverse industries viz. Nikam Iron Sintered Products Pvt.Ltd., TATA Steel, RVB Shorlube Industry Pvt.Ltd., PR & SE Carbides Pvt. Ltd., Gopani Filters Pvt. Ltd., Yogeshwar Engg. Pvt Ltd., SAP Parts Pvt. Ltd., IIT Kharagpur, Institution of Engineers, NIT, Jamshedpur and The Electric House. After completion of all the sessions, an open book exam was conducted and e-certificates were given to the participants. During the valedictory function (online snap shown in Fig. 2), each participant was encouraged to share his / her experience in PMSC22 and to communicate the scope of improvement in PMSC22 to further increase the usefulness of the course. The course feedback was collected from all the participants and the overall rating for the course came out to be 4.2 out of 5. Few suggestions were given by the participants to further improve the course effectiveness viz. details related to PM in semiconductors and insulators, elaborate information on techno commercial aspects of PM, special training session on sintering of iron powder products and introduction of interactive sessions in between to have PM discussions with the experts and speakers.



**Fig. 1 Snap of the inaugural function which took place on 21<sup>st</sup> September 2022.**



**Fig. 2 Snap of the valedictory function which took place on 24<sup>th</sup> September 2022.**

# Course on Tool Design Process for PM Parts

The Powder Metallurgy Association of India, conducted 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 during 8-10 November 2022. The course was conducted by Mr. Sanjay Rastogi, a 1987 graduate in mechanical engineer from NIT Allahabad (U.P). having 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

The course presented 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.

## Important topics that were covered

- Basics of Powder Metallurgy & Compaction
- Compaction – Fundamentals
- Compaction – Interrelation between Product & Tool Design
- Tool Friction & M/Q Ratio
- Elasticity of Tools & Product Quality
- Effect of Magnetism on Pressing Process
- The Adapter as Link between Tool and Press
- Tool Design Process – Product to Tool
- Tool Design Process – General Assembly

## Participants

- Mr. Natraj - Design Head Sintering Solutions
- Mr. Balasundaram - Customer Relations, Sintering Solutions
- Mr. Arun Kumar - Design Engineer, Sintering Solutions
- Mr. Prasad Khapre – SAP Parts
- Kunal Nikam – Nikam Iron Sintered
- Alok Kanani – Yogeshwae Engineering
- Utkarsh Mahajan – Radiant Industries



Mr. Sanjay Rastogi conducting classes for Tool Designing Course



# Course on Heat Treatment of PM Parts

PMAI conducted Two-day course on a crucial area of “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 during 9<sup>th</sup> and 10<sup>th</sup> December 2022.

The course presented a technology overview for new and prospective entrants to the PM and was conducted by Mr. NL Chandrachud, BE Metallurgy from COEP Pune in 1974 and M.Tech Metallurgical Engineering from IIT Bombay in 1976. He worked as Senior Scientific Officer at DMRL, Hyderabad for about 2 years and took assignments as Manager-Metallurgy for about 16 years at Telco (Tata Motors) Pune, General Manager - Materials Engineering at Cummins India, Pune for 10 years, Executive Vice President at GKN Sinter Metals, Pune for about 12 years. At present - he is Consultant to GKN-Hoeganaes Corporation, USA. Mr. Chandrachud was ably supported by Prof. N.B. Dhokey of Metallurgy and Material Science Department of COEP, Pune with Mr. Sandeep Menavalikar consulting expert ex-GKN Sinter Metals.

## Important topics that were covered

**Introduction to Powder Metallurgy**  
**Why Heat Treatment? Improvement in Static and Dynamic Strength.**  
**Theory of Quenching – Quenchants for PM Parts - Oils and Polymers**  
**Steam Treatment**  
**Heat Treatment of Tool Steels;**  
**Furnace in relation to the Thermal Processing of Metals,**  
**Furnace Protective Atmospheres**

## Participants

Ms. Snehal Pande	John Deere, Pune
Samir Kamble	Nikam Iron Sintered products, Kolhapur
Nandkishor Raut	Inmet Technology Solutions Pvt Ltd., Pune
Mr Santu Jan	Speciality Sintered, Pune



Mr. Menavalikar discussing with participants



Prof. Dhokey Interacting with participants

## Industry News



Industrial Metal Powders received award for Export in 2017-18 **Smt. Anupriya Patel**, Hon'ble Minister of State for Commence & Industry, Govt. of India gave the awards. Marketing Manager of IMP Mr. Shreekant received the award on 17.12.22.



Hearty congratulations to Speciality Sintered Products Pvt Ltd who received award for **Highest Growth In Exports** at the hands of **Smt. Anupriya Patel**, Minister of State for Commerce and Industry, Government of India.



Dr. Prakash Dhoka receiving Life time achievement award by DCCIA at the hands of Hon. Governor of Maharashtra on 8.12.22

## Member Achievements



Mr. Prakash Dhoka Founder Member of PMAI has been conferred with Doctorate degree by Vishwakarma University Pune, in open defence.



PMAI Congratulates, Prakash Khole for his 10 years service recognition in Rio Tinto.