



**ASM Pune Chapter**  
INTERNATIONAL



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## Chapter News Letter



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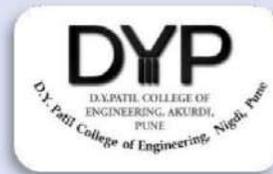
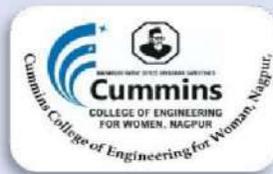
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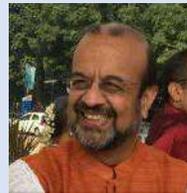
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**Prof. Sanket S Chikshe**

ASM Faculty Advisor, PVGCOET, Pune

ASM International (formerly known as the American Society for Metals) is a professional organization for materials scientists and engineers. It serves as a global hub for materials science, engineering, and metallurgy, promoting research, education, and industry collaboration. ASM provides access to a wealth of technical resources, journals, conferences, and training programs, helping professionals stay updated with advancements in materials, manufacturing, and failure analysis. The society plays a key role in fostering innovation and supporting engineers in developing high-performance materials for ASM International, originally known as the *American Society for Metals*, is a global community of materials engineers, scientists, researchers, and industry professionals. Founded in 1913, ASM has grown into one of the most respected organizations in the field of materials science and metallurgy.

ASM is all about advancing materials knowledge and connecting people who work with metals, polymers, ceramics, and composites. Here's what makes it important:

1. **Knowledge & Research** – ASM publishes technical handbooks, journals, and case studies that help engineers and scientists stay up to date with the latest advancements in materials.
2. **Education & Training** – The organization runs training programs, certifications, and online courses (including NPTEL) to help students and professionals sharpen their skills.
3. **Networking & Industry Collaboration** – ASM brings together experts from **academia, research, and industry**, creating opportunities for learning and career growth.
4. **Conferences & Events** – They organize global events where professionals share insights on **metallurgy, manufacturing, failure analysis, and advanced materials**.
5. **Innovations in Additive Manufacturing** – ASM has been at the forefront of **3D printing and advanced manufacturing**, supporting research and real-world applications in aerospace, automotive, and biomedical industries.

**EDITORIAL**

Dear ASM Members and Esteemed Colleagues,

It brings me great joy to present this edition of our ASM Newsletter, where we showcase not only the advancements, we've made but also the spirit of innovation and collaboration that defines our community. As we continue to make strides in materials science, this newsletter stands as a testament to the hard work and dedication that all of you have put into pushing the boundaries of knowledge. This issue brings together a series of remarkable technical articles from our talented students, faculty, and industry collaborators. These articles highlight cutting-edge research, emerging trends, and the exciting opportunities within materials science. I encourage you to dive deep into these works and explore the concepts that are shaping the future of our field.

Furthermore, I'm proud to highlight the technical talks and workshops organized under the ASM banner at our college. These events have not only created a platform for knowledge exchange but have also opened doors to valuable networking opportunities with industry professionals and academic leaders. It has been truly inspiring to witness students, researchers, and professionals come together for thought-provoking discussions that bridge the gap between theoretical research and real-world applications. As we move forward, let us continue to build upon these initiatives, staying focused on fostering a spirit of collaboration, curiosity, and excellence. Our collective efforts make ASM a thriving hub for knowledge, innovation, and positive change in materials science. I look forward to the exciting developments in the months to come and am confident that we will continue to make a significant impact in the field. Thank you for your unwavering commitment and passion for advancing our shared mission.

Warm regards,

**Prof. Sanket S Chikshe**

*Assistant Professor, PVG's College of Engineering and Technology & GKPIOM, Pune*

## Large-Scale 3D Printing in Practice: Fabrication of a Centrifuge Basket for Molasses Separation

*Amit Joshi, Shruti Nath and Harsh Yadav*

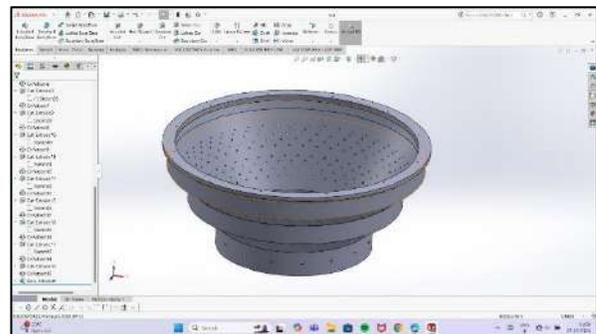
*Department of Mechanical Engineering, PVGs COET, Pune | ASM Students Chapter*

One of the projects undertaken this year in our 3D Printing Laboratory was the fabrication of a large-scale prototype of a centrifuge basket for molasses separation. With an overall size of approximately 800 mm in diameter and 450 mm in height, this project gave us an opportunity to solve a shopfloor engineering problem.

The primary machine used for this work, the Creality K2 Plus, offers a build volume of  $350 \times 350 \times 400$  mm. Manufacturing a component more than twice this diameter required creative segmentation strategies as well as a deeper understanding of printer behaviour, environmental effects and large-assembly workflows.



1 Centrifuge Basket Used in Molasses Separation



2 Centrifuge Basket CAD Model

### Iterative Development and Design Strategy

Our early approach involved dividing the model into four large vertical sections. Although simple in concept, the resulting parts were extremely tall and time-intensive to print. These prints suffered from frequent failures, warping, and loss of dimensional consistency.

The next iteration increased segmentation to twelve vertical sections creating tall and slender parts. These geometries were highly sensitive to vibration and exhibited inconsistent layer quality, leading to mid-print failures and cumulative alignment errors.

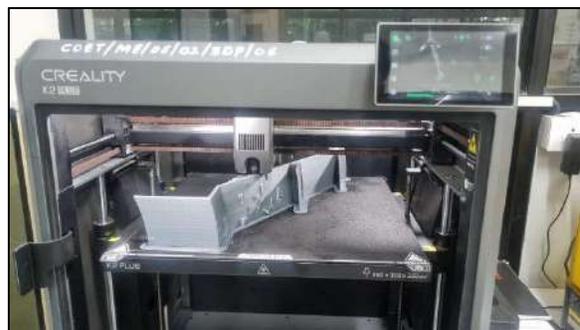
A further revision to fourteen vertical segments improved dimensional control, but two critical limitations became apparent. The parts were still very close to the printer's maximum build envelope and long, narrow prints were amplifying even small mechanical disturbances.



*3 Segmentation and Bonding*

### **Vibration Insight and Process Breakthrough**

At this point, the team identified that the supporting table beneath the printer had a slight wobble. Instead of damping gantry-induced vibrations, it reflected them back into the system. Tall prints behaved like cantilever structures, magnifying small disturbances into layer shifts and surface defects. To address both height-related instability and vibration sensitivity, the segmentation strategy was redesigned. Each of the fourteen vertical segments was additionally split horizontally into two shorter sections. This hybrid vertical-horizontal approach significantly reduced print height, improved bed adhesion, and lowered the risk of vibration-driven failures. Following this change, print success rates improved dramatically.



*4 Print failure due to excessive gantry vibration (induced by wobbling table)*

This phase of the project clearly demonstrated that large-scale additive manufacturing is a system-level challenge, where printer mechanics, environmental stability and part geometry are deeply interconnected.

### **Part Management and Assembly Workflow**

With a large number of components in circulation, organization became critical. Each printed part was assigned a unique identification code and tracked during printing and post-processing. Dry-fits were conducted before bonding to verify alignment, symmetry, and concentricity. Initial positioning was carried out using cyanoacrylate (superglue), followed by structural bonding with slow-curing Araldite epoxy which was selected for its high bond strength and gap-filling capability. Assembly was performed in stages, with dimensional checks at each step to preserve overall geometry. Once fully assembled, the basket underwent surface finishing, light sanding at joints, and final painting, transforming the segmented structure into a visually cohesive demonstration component. The basket was

printed primarily in PLA, chosen for its dimensional stability, ease of printing, and surface finish consistency across long build times. CAD development and segmentation were carried out using Fusion 360 / SolidWorks, while Cura and Creality Print were used for slicing and print preparation. Meshmixer supported mesh repair and splitting operations, and spreadsheet-based tracking was used for part identification and assembly planning.

**Key Learnings:**

This project taught us several important engineering lessons:

- Large-scale 3D printing demands a holistic engineering approach, not just printer operation
- Environmental and support conditions can significantly influence print outcomes
- Iterative failure analysis is central to process improvement
- Assembly strategy and adhesive selection are as critical as the printing stage itself

Beyond the final component, the project now serves as a teaching aid, laboratory showcase, and case study in large-format additive manufacturing. It closely mirrors real industrial challenges, where scale-up often reveals hidden constraints that are not apparent in smaller prints.

The completed centrifuge basket stands as a proud achievement of our 3D Printing Laboratory and ASM Student Chapter, highlighting persistence, teamwork, and the practical application of engineering insight.

## Technical Talk Under ASM Students Chapter

**Organised by the ASM Student Chapter**

**Event Title:** Tech Talk on Additive Manufacturing

**Date:** 24 February 2025

**Speaker:** Mr Sarvesh Velankar, Lead Engineer, Atlas

**Target Audience:** Undergraduate Mechanical Engineering Students

**Number of Attendees:** 30

### Introduction

The ASM Student Chapter organized a Tech Talk on Additive Manufacturing on 24 February 2025 with the objective of providing mechanical engineering students with industry-oriented insights into modern manufacturing technologies. The session aimed to bridge the gap between academic concepts and real-world industrial practices in the rapidly evolving field of additive manufacturing.

The talk was delivered by **Mr. Sarvesh Velankar**, Lead Engineer at Atlas, whose professional experience in industrial additive manufacturing enabled students to gain clarity on practical applications, current industry challenges and future opportunities in this domain.

### Overview of the Session

The session was structured to combine fundamental principles with industrial perspectives. Mr. Velankar explained how additive manufacturing has evolved from a rapid prototyping tool into a viable manufacturing solution for functional and end-use components. Applications across sectors such as automotive, aerospace, healthcare, and tooling were discussed to highlight the growing industrial relevance of additive manufacturing.

The talk was delivered using practical examples and comparative analysis with conventional manufacturing methods, ensuring accessibility for undergraduate students while maintaining technical depth.

### Additive Manufacturing Processes and Materials

The speaker introduced students to commonly used additive manufacturing processes, including Fused Deposition Modeling (FDM), Selective Laser Sintering (SLS), Selective Laser Melting (SLM), and Electron Beam Melting (EBM). Differences between polymer-based and metal-based processes were explained, along with criteria for selecting suitable processes based on application requirements.

Significant emphasis was placed on the role of materials in additive manufacturing, aligning closely with ASM's focus on materials science. Discussions included commonly

used polymers and metal powders, and how material selection influences strength, surface finish, cost, and post-processing requirements. This helped students understand the relationship between materials, process parameters, and final component properties.

### **Industrial Applications and Design Considerations**

Mr. Velankar shared several real-world industrial applications of additive manufacturing, including rapid prototyping, manufacturing of tooling and fixtures, lightweight components for aerospace and automotive applications, and customized low-volume production parts. These examples provided students with a practical understanding of how additive manufacturing is integrated into industrial workflows.

The concept of Design for Additive Manufacturing (DfAM) was also highlighted, emphasizing the need to design components specifically for additive processes rather than adapting conventional designs. Topics such as part orientation, support structures, internal lattices, and topology optimization were discussed to demonstrate how design freedom can be effectively utilized to reduce material usage while maintaining structural integrity.

### **Challenges and Future Trends**

The session also addressed current challenges in additive manufacturing, including high initial investment costs, surface finish and dimensional accuracy limitations, and the need for post-processing operations. It also helped students develop a balanced understanding of the technology.

The talk concluded with an overview of emerging trends such as hybrid manufacturing systems, large-scale additive manufacturing, increased adoption of AM for serial production, and the integration of simulation and artificial intelligence for process optimization.

### **Interaction and Learning Outcomes**

The session was interactive, with students actively engaging in discussions related to career paths, required skill sets, software tools, and research opportunities in additive manufacturing. The speaker addressed these queries in detail, making the session informative and motivating.

By the end of the Tech Talk, students gained a clearer understanding of industrial additive manufacturing practices, material and process selection, current challenges, and future opportunities in the field.

### **Conclusion**

The Tech Talk on Additive Manufacturing was a technically enriching experience that successfully connected academic learning with industrial practice. The session reinforced

the importance of industry–academia interaction and provided students with valuable insights into the practical relevance and future scope of additive manufacturing. The ASM Student Chapter looks forward to organizing more such industry-oriented technical sessions.



*Glimpses from the Additive Manufacturing Tech talk*

## Industrial Exposure: Kinetic Spraymet Technologies



### *Industrial Visit Report – Kinetic Spraymet Technologies*

The ASM Student Chapter organized an industrial visit to Kinetic Spraymet Technologies on 11 February 2025 for third- and final-year mechanical engineering students under the guidance of Dr. Karandikar (ASM Member). The visit aimed to provide practical exposure to industrial surface engineering practices and modern manufacturing workflows.

During the visit, students were introduced to advanced coating and surface modification technologies used to enhance wear resistance, corrosion protection, and thermal performance of mechanical components. Processes such as plasma spray and High-Velocity Oxygen Fuel (HVOF) coating were discussed, with emphasis on their industrial applications in automotive, power, and heavy engineering sectors. The importance of surface preparation, coating adhesion, and thickness control in determining component performance and service life was highlighted.

A key highlight of the visit was observing the practical application of a 6-axis industrial robotic system used for automated coating operations. The robotic setup demonstrated improved precision, repeatability, and safety in industrial environments. Students were able to directly relate this system to the 6-axis robot available in their college laboratory, reinforcing concepts of automation and robotic kinematics.

Overall, the visit successfully bridged theoretical knowledge from materials science, manufacturing processes, and automation with real-world industrial practice, making it a valuable learning experience for participating students.

### **Additive Manufacturing Internship Inauguration**

The inauguration of the Additive Manufacturing Internship Programme was successfully conducted at our college, marking the beginning of an initiative aimed at equipping students with practical knowledge of advanced manufacturing technologies. The event was organized to formally launch the internship and to introduce participants to the scope, objectives, and significance of additive manufacturing in today's rapidly evolving engineering landscape.

We were privileged to have esteemed industry professionals as our chief guests: Mr. Viraj Nipunage, CEO of Alacrity (an Additive Manufacturing Technology company), and Dr. Kruttika Apshankar-Kher, Director at Energy Systech. Their presence greatly enriched the occasion. Each guest shared valuable insights on the growth of additive manufacturing, its industrial relevance, and the wide range of career opportunities it offers.

The programme began with a formal welcome, followed by the inauguration ceremony and guest addresses. The speakers highlighted the importance of industry-academia collaboration and emphasised how such internships bridge the gap between classroom learning and real-world applications. The inauguration concluded on an inspiring note,

setting a strong foundation for a meaningful and technically enriching internship experience.



*5 Glimpses from the Inauguration Event*

### ASM International Awareness Lecture

An ASM students chapter awareness lecture was conducted in KK Wagh engineering college in Nashik on the 2nd of January, 2026 by Mr. BR Galgali and Mr. Deepak Kulkarni. Information on ASM Nashik Chapter formation was given by Mr Galgali (Chairman – ASM (INT) India National Council-2025-27). Information about the Executive Committee of ASM Pune chapter, various Initiatives of ASM Pune- Conferences held in last 8 years, Tech Talk Sessions conducted in Year 2025 and the advantage of Students MA chapters were the topics discussed. Mr. Galgali shared information @ ASM INTERNATIONAL HQ, ASM Chapter Benefits, initiatives by ASM-India National Council (INC), Why ASM Chapter at Nashik is required, info @ Formation of ASM Nashik chapter, Membership Fees and appealed for taking ASM Membership by the individuals so as to form a separate ASM NASHIK Chapter at the earliest. A very good response was received from the students.



## Technical Lectures

The ASM Tech Talk Session was held at the SSK SOLITAIRE Nashik on the 16th of January. The topic was "Latest Trends in Eddy Current Technology & (its) AI Evolution" by Mr Anil Tathawadekar (Director – ABAN Technologies).

The speaker covered the basics of eddy current testing, eddy current inspection for micro-structural sorting (hardness, case depth, material mix, heat treatment), eddy current inspection for surface defects (crack, pore, grinding burn), eddy current based sorting applications (bearing, fasteners, induction hardening) and AI ECT for case depth evaluation.



IBG has pioneered multi frequency eddy current testing for finished components and continues elevating the quality standards through continuous development and innovation. In principle, eddy current testing is the most versatile and quick NDT technique easily catering mass produced components. Ever evolving microelectronics and strong deep

learning AI techniques have now opened the doors of surface hardness value detection & induction hardening case depth prediction, which will be a game changer in the coming decade in the field of non-destructive testing.

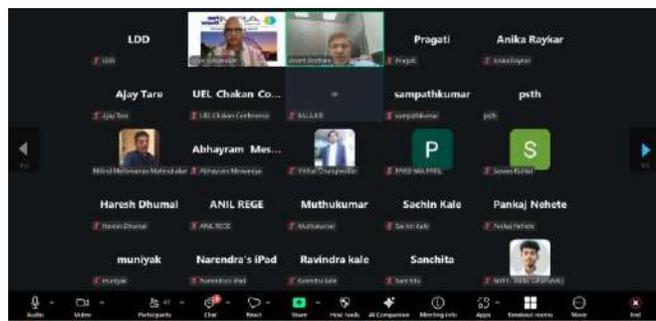
This session was combined with the ASM awareness session mentioned above where Mr. Galgali, Mr. Adiverekar and Mr. Deepak Kulkarni were present as ASM Pune Chapter EC members. Around seventy-five participants including material professionals, heat treatment professionals, ASM Pune-EC members, members of ABAN Technologies and professors and Students from the KK Wagh Institute of Engg. Edu & Research, Nashik were present during this Tech Talk Session. It was very informative & interactive and ended with the Questions and Answers from the participants. The vote of thanks was given by Mr. Deepak Kulkarni (Joint Secretary-ASM Pune chapter).

This session was followed by dinner.

Another online technical Talk was conducted on the 22nd of January, 2026 on the topic ‘Gas Nitriding / Nitrocarburizing process control by Kn Control’. The speaker was Mr Anant Andhale (CTO & Business Head - Unitherm Engineers Ltd). He has completed his BE Metallurgy from the College of Engineering Pune (COEP) Executive MBA- IIMA and has more than 20 years of experience in the heat treatment industry.

Mr. Andhale presented and elaborated on - Basic of Gas Nitriding Process, Gas Nitriding Process Flow, Types of Nitriding Furnaces, Gas Nitriding Mechanism & Gas Nitriding process control by Kn. He also elaborated on – Benefits of Gas Nitriding process control by Kn versus Manual control. Namely minimal white layer, low (or high) porosity - with KC control, controlled gamma prime or epsilon phases and case reproducibility.

Our EC members, Individual members, Tech Committee members & Students from ASM Material Advantage Chapter i.e a total of 46 participants were present during this Tech Talk Session. The vote of thanks was given by Ms Anika Raykar Student from MA Chapter from CCOEW, Pune.



At ASM International, we believe that materials are the foundation of innovation, shaping everything from the infrastructure we rely on to the cutting-edge technologies that define our future. As the world’s leading professional organization for materials science and engineering, we are committed to advancing knowledge, professionals in metallurgy, materials research, and related disciplines.

For over a century, ASM International has been a hub for scientists, engineers, educators, and industry leaders who are dedicated to pushing the boundaries of materials performance. Our society thrives on education, research, and technological advancements, bringing together experts to solve complex challenges in aerospace, automotive, biomedical, energy, and countless other industries.

We believe in the power of knowledge-sharing, mentorship, and continuous learning. Whether you are a student exploring materials science, a seasoned professional seeking the latest advancements, or an industry leader driving change, ASM International is your gateway to growth, innovation, and excellence.

Join us in our mission to inspire progress, strengthen industries, and build a more sustainable future through the power of materials. **Together, we are shaping the future of science, technology, and engineering.**

For ASM Pune chapters Membership, interested participants to contact Mr Vaibhav Chiplunkar (Chairman-ASM Pune Membership Development Committee)

(Mobile-7350799376)

**Volunteer yourself for your Chapter!**

For more efficient working & expanding network of your ASM International Chapter, please support your chapter by offering your time. Lot of avenues to choose areas of your liking. Options are - Membership Development, Education Programs, Students Outreach, Member Service, Website, News Letter, Technical Program and Social Events. Contact ASM International Pune Chapter [asm.pune@gmail.com](mailto:asm.pune@gmail.com)



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