3D PRINTING INSIGHT

NOV 2024

THE INSIGHT INTO 3D PRINTING & ADDITIVE MANUFACTURING TECHNOLOGY

www.amsi.org.in

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AMSI
ADDITIVE MANUFACTURING SOCIETY OF INDIA

3D PRINTING INSIGHT

PRESIDENT'S REPORT

We are excited to present the November 2024 issue of the '3D Printing Insight', a joint effort by the Additive Manufacturing Society of India (AMSI) and the Indian Women in 3D Printing organization (IW3DP). AMSI proudly unveils its new logo and outlines five key objectives for the next five years:

- **MADE IN INDIA – MADE FOR THE WORLD:** Foster the development of industry-grade additive manufacturing machines, materials, and software in India for global markets.
- **Enhance 3D Printing Applications:** Work towards expanding the applications of 3D printing across various sectors in India.
- **Skilling and Upskilling:** Offer industry-driven skill enhancement courses in 3D printing, additive manufacturing, Industry 4.0, and digital twin platforms.
- Mentoring and Incubation: Provide guidance and support for startups and incubators in the additive manufacturing domain.
- Global Networking: Facilitate connections with global additive manufacturing industries, organizations, and academic institutions through technology showcases and conferences.

A heartfelt thank you to all our esteemed guests, speakers, and delegates for making this event a success. Your presence and insights have truly enriched our discussions and are paving the way for an innovative ecosystem in 3D Printing. Let's continue to collaborate and drive the future of additive manufacturing. We look forward to welcoming you to AMNEXT - 2025 - the 4th International Conference & Exhibition

We thank our corporate and academic members for their unwavering support in fostering a thriving 3D printing technology ecosystem in India with AMSI.

Sincerely,
Dr. L. Jyothish Kumar
President, AMSI

3D PRINTING INSIGHT

CHAIRWOMAN'S REPORT

Dear IW3DP Members, Patrons and Enthusiasts,

As the Chairwoman of the Indian Women in 3D Printing Society (IW3DP), I am thrilled to share our latest initiatives and achievements that reflect our commitment to empowering women in the realm of 3D printing technology.

This year, as a continuation of IW3DP - UpSkill 3D program we have trained BMS College of Engineering and RV College of Engineering - Student chapters with Basic 3D printing skills.

This initiative is in collaboration with EOS and Additive Learning. We believe this skill enhancement training equips aspiring female engineers and students with the necessary tools and knowledge to excel in the rapidly evolving field of additive manufacturing.

One of our standout projects this quarter has been the Development of **Braille Alphabets** using 3D printing technology for the visually challenged children at a prominent NGO. This initiative not only aids these children in enhancing their vocabulary but also provides them with a fun way to engage with language through games like scrabble. It is heartwarming to see how technology can be harnessed for social impact, making a tangible difference in the lives of those who need it most.

IW3DP also co-hosted the 13th International Conference on 3D Printing Technologies - AM 2024 alongside Additive Manufacturing Society of India. As part of the conference, the 3D Printing Innovation Challenge, **ENIVISION 3D** – The Design for Tomorrow, supported by the Central Manufacturing Technology Institute, showcased students' creativity and innovation in 3D printing.

As we continue our journey, I encourage all members to engage actively in our programs and initiatives. Together, we can inspire more women to embrace careers in 3D printing and contribute to a more inclusive future.

Thank you for your unwavering support.
Dr. Kavya Shree K

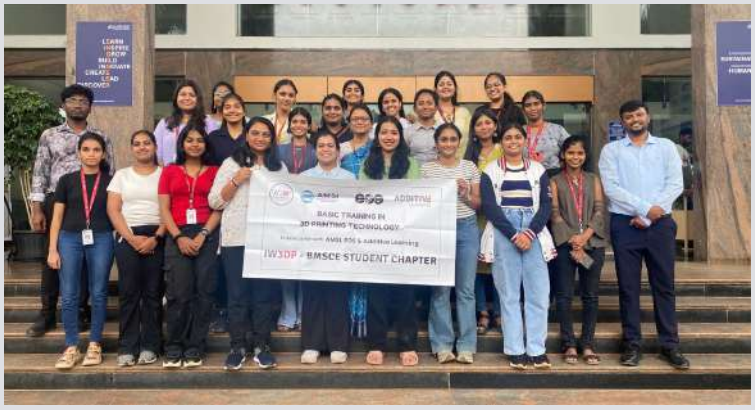
ORGANIZATION UPDATES

INDIAN WOMEN IN 3D PRINTING

UPSKILL 3D - IW3DP SKILL DEVELOPMENT INITIATIVE

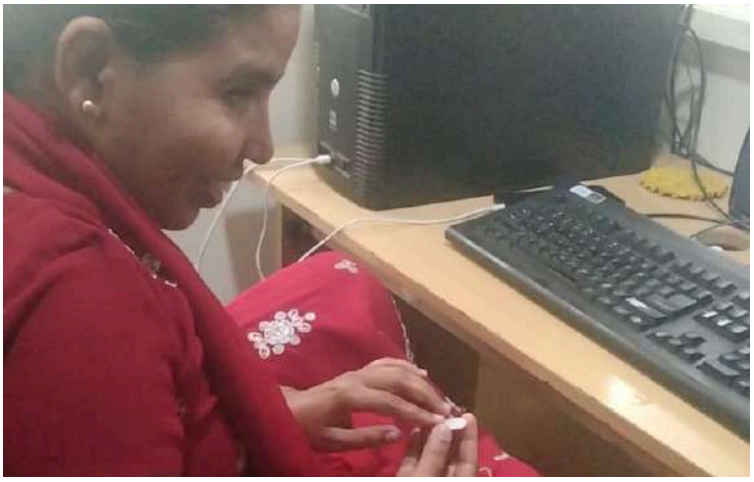
'*Bridging the Gap between Skill Acquired vs Skill Required*'

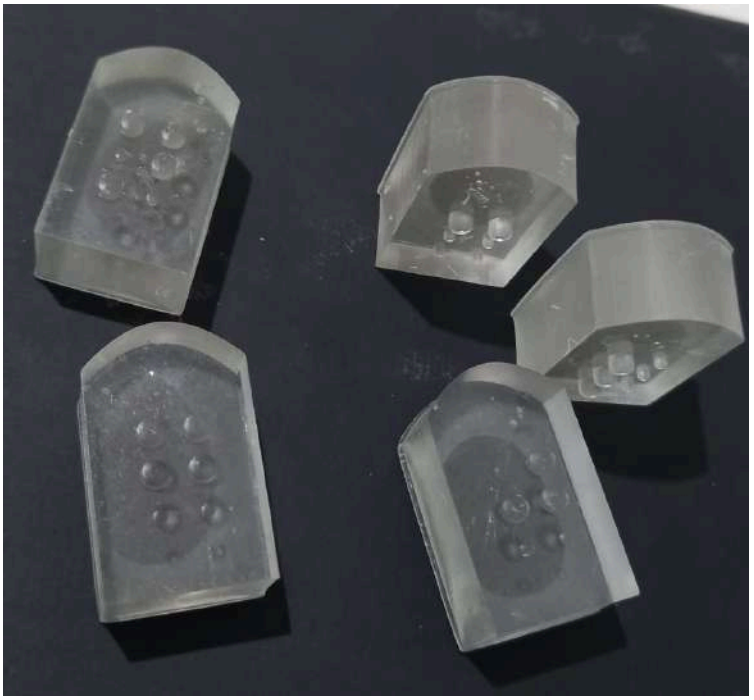
IW3DP in association with EOS & AMSI hosts **Basic 3D Printing Training** for **R. V. College of Engineering - Bangalore, BMS College of Engineering - Bangalore** students at Additive Manufacturing Lab at Cambridge Institute of Technology, Bangalore.



IW3DP SOCIAL IMPACT PROJECT

DEVELOPMENT OF BRAILLE ALPHABETS USING 3D PRINTING TECHNOLOGY





We are proud to have developed Braille Alphabets using 3D printing technology for visually challenged children at a prominent NGO. This initiative enhances their vocabulary and provides a fun, interactive way to engage with language through games like Scrabble, showcasing the power of technology for meaningful social impact.

ORGANIZATION UPDATES

INDIAN WOMEN IN 3D PRINTING

On 18th October 2024, Dr. Kavya Shree, Chairwoman of Indian Women in 3D Printing, participated as a panel expert in the "Symposium on Additive Manufacturing" during Skill Conclave 2024 in Goa.

Indian Women in 3D Printing, in collaboration with the Additive Manufacturing Society of India, successfully organized the **13th International Conference and Exhibition on 3D Printing and Additive Manufacturing Technologies.**

As part of the conference, the 3D Printing Innovation Challenge, **ENIVISION 3D – The Design for Tomorrow**, was successfully organized with support from the Central Manufacturing Technology Institute, showcasing innovative student designs in 3D printing.

The event brought together global experts, industry leaders, and innovators, fostering meaningful networking and advancing ecosystem development in the additive manufacturing domain.

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ORGANIZATION UPDATES

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Successful Completion of AM 24 Conference & Exhibiiton: The event was a resounding success, fostering valuable networking opportunities and driving ecosystem creation in the Additive Manufacturing domain.

The Additive Manufacturing Society of India (AMSI) proudly organized the 13th International Conference and Exhibition on 3D Printing and Additive Manufacturing Technologies, bringing together global experts, industry leaders, and innovators.

Felicitation Ceremony: Dr. L Jyothish Kumar, President, AMSI, was conferred with the prestigious title of Professor in Practice.by Dr. Vishnu Bharath, Chairman, APS Education Trust, Bangalore

On 9th November 2024, during the Graduation Day ceremony at APS College of Engineering,
Dr. L. Jyothish Kumar, President of the Additive Manufacturing Society of India (AMSI), was conferred with the prestigious title of Professor in Practice.
This recognition highlights his exceptional contributions to the field of additive manufacturing and academia.

AMSI proudly announces our Expert Technology Talk Series: Monthly Innovations in Additive Manufacturing. Mr. Daniel Plos and Mr. Peter Leitner from Hexagon Manufacturing Intelligence, GmbH.

amnext-25
ADDITIVE MANUFACTURING TECHNOLOGY SHOW

As we close the chapter on this remarkable event, we are already looking forward to welcoming you to AM 2025! Together, let us continue to shape the future of Additive Manufacturing with innovation, passion, and purpose.

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ORGANIZATION UPDATES

ADDITIVE MANUFACTURING SOCIETY OF INDIA

Pre-conference workshop on "3D Printing Advances in Biomedical Innovation" on 23rd October 2024.

The Additive Manufacturing Society of India (AMSI), in collaboration with MS Ramaiah University of Applied Sciences, successfully organized a pre-conference workshop on "3D Printing Advances in Biomedical Innovation" on 23rd October 2024.

The workshop highlighted cutting-edge advancements and applications of 3D printing in the biomedical field, fostering insightful discussions and knowledge sharing among experts and participants.

amnext 25 - Launch

amnext-25, the 14th International Conference & Expo on Additive Manufacturing and 3D Printing Technologies, was officially launched by esteemed dignitaries, including:

- **Dr. M. Arumugam, Outstanding Scientist & Dy. Director, LPSC, ISRO**
- **Dr. Sandip Chatterjee, Senior Advisor, SERI USA, Ex-Group Coordinator, MeitY**
- **Dr. Nagahanumaiah, Director, CMTI, Ministry of Heavy Industries**
- **Dr. Shirish S. Kale, Director (Mat & PI), CEMILAC, DRDO**
- **Dr. Sanjay G. Barad, Scientist 'H', GTRE, DRDO**

The event marks a significant milestone in advancing additive manufacturing and 3D printing technologies.

"Symposium on Additive Manufacturing" - Skill Conclave 2024 in Goa

On 18th October 2024, Dr. L. Jyothish Kumar, President of the Additive Manufacturing Society of India, served as a panel expert at the "Symposium on Additive Manufacturing" during Skill Conclave 2024 in Goa.

Organized by the National Additive Manufacturing Center West (MeitY) in collaboration with Ganpat University, the event highlighted advancements in additive manufacturing and its role in industry skill development.

LATEST NEWS - 3D Printing insight

HP and Global Steel Giant ArcelorMittal Announce Strategic 3D Printing Collaboration

Fortune Global 500 company ArcelorMittal, the world's second-largest supplier of steel, has announced a strategic collaboration with HP to develop new additive manufacturing (AM) applications for ArcelorMittal's steel powders. Via the partnership, the two companies will collaborate to bring new steel powders to a sufficient level of technical maturity, and then work with customers to create new steel use-cases for HP's Metal Jet S100 metal binder jetting (MBJ) printer. ArcelorMittal and HP will use the steel giant's global R&D infrastructure, featuring 11 different sites on three continents and employing around 1,500 workers, to qualify parts for customers prior to commercialization.

Once the parts are qualified, the partnership should also benefit from HP's Metal Jet Production Service, announced in June 2024. ArcelorMittal has been involved in AM for almost a decade, and in the fall of 2023 announced its first dedicated AM unit, ArcelorMittal Powders, with initial plans to produce 1,000 tons of steel powder per year at a facility in Spain. The conglomerate has emphasized sustainability as a key consideration driving its interest in AM, and through its work with HP, aims to both expand the options in its material portfolio and lower the cost per part for its steel powders.

In a press release, Aubin Defer, the chief marketing officer at ArcelorMittal Powders, said, "We are thrilled to collaborate with HP in advancing steel [AM]. This collaboration leverages our combined expertise to develop innovative solutions to drive the industry forward. The promising results of our steel powders with HP's binder jetting technology are a testament to the potential of this partnership." HP's global leader of Metals Sales & Go To Market, Alexandre Tartas, said, "We are excited to join forces with ArcelorMittal to push the boundaries of steel [AM].

This collaboration will enable us to leverage our technical expertise and ArcelorMittal's leadership in sustainable steel solutions to create groundbreaking advancements in the industry.Combining the steel expertise of ArcelorMittal and HP [AM] positioning in high volume production offers a unique value proposition for the manufacturing industry."

This is an ideal AM partnership on multiple different levels: in particular, the geographic reach and scalability potential of both companies involved gives the initiative a unique opportunity to genuinely accelerate metal AM adoption. Accelerating adoption is what more or less every collaboration in the AM space sets out to do, but ArcelorMittal and HP are two companies that actually have the infrastructure in place to deliver on that promise

This latest announcement further reinforces what has been a mounting trend for HP, which is a focus on the Indian market. Between the company's collaboration with INDO-MIM, its work with key service bureaus in India, and now the ArcelorMittal deal, HP seemingly has this increasingly important territory on lock when it comes to MBJ..

Given how significant India's manufacturing sector already looks like it will be for the Trump administration's industrial policy, HP may get the chance to test its India scale-up strategy rather immediately. If it works out, it will no doubt be a crucial model for the company's AM strategy on a global level.

Formnext: TRUMPF makes 3D-printing even more productive

Dual 700-watt lasers with Automatic Multilaser Alignment (AMA) and integrated cooling ensure efficient volume production and stronger parts for the TruPrint 3000 3D printer // Benefits users across industries, including automotive and aerospace.

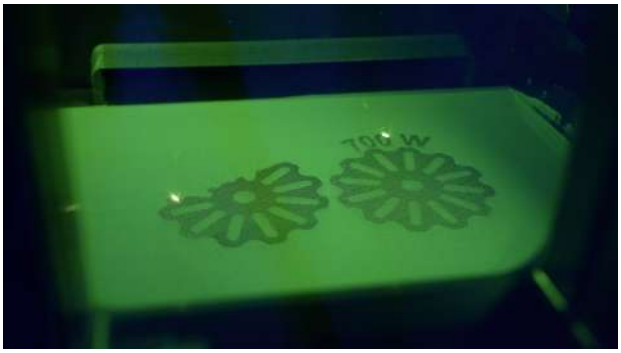
Ditzingen/Frankfurt, 07 November 2024 – At Formnext, TRUMPF is focusing on more productive 3D printing systems. The high-tech company has equipped the TruPrint 3000 with an integrated cooling system for the build platform and increased the laser power of the two fiber lasers to 700 watts. "The TruPrint 3000 is designed for volume production of high-quality parts. Users from all industries, such as the automotive and aerospace industries, will benefit from it," says Roland Spiegelhalder, Product Manager for Additive Manufacturing at TRUMPF. The high-tech company is presenting the 3D printer at Formnext, the leading trade show for additive manufacturing, in Frankfurt, Germany.

TruPrint 3000 prints stronger parts with integrated cooling

In the TruPrint 3000, a system monitors the process area and maintains a constant temperature. This allows the 3D printer to use the full 700 watts of laser power without overheating the material during the printing process. This is especially important for aluminum alloys, for example. The integrated cooling also allows the material to cool more quickly.
As a result, components are more durable and there is a high level of reproducibility, meaning that the machine can print the same part repeatedly with the same quality standard. This benefits industries such as automotive, where the TruPrint 3000 can be used to mass□produce crash-resistant parts.

Thanks to the increased laser power of 700 watts, TRUMPF was able to increase the size of the machine's two laser spots from 80 to 200 µm using special optics. This allows the lasers to process a larger area on the build plate. "This increases the productivity of the system while maintaining the same high part quality," says Spiegelhalder.

Two 700-watt lasers The TruPrint 3000 prints with two 700-watt lasers.
(Image: TRUMPF)



Presentation at Formnext TRUMPF is presenting the TruPrint 3000 at the Formnext trade fair in Frankfurt (Image: TRUMPF

About TRUMPF

TRUMPF is a high-tech companyoffering manufacturing solutions in the fieldsof machine tools and laser technology. The Company drives digital connectivity in the manufacturing through consulting, platform products and software

TRUMPF is one of the technology and market leader in highly versatile machine tools for sheet metal processing and in the field of industrial lasers. In 2022/23, the company employedsome 18,400 people and generated sales of about 5.4 billion euros. With over 80 companies, the TRUMPF Group is represented in nearly every European country as well as in North America, South America and Asia. The company has production facilities in Germany, France,the United Kingdom,Italy, Austria, Switzerland, Poland, the Czech Republic, the United States, Mexico and China.

Find out more about TRUMPF at **www.trumpf.com**

An Intelligent Strategy for Achieving Excellence: MTU Relies on Additive Manufacturing for its Series Component Production

EOS Technology Enables the Cost-Effective Manufacture of Engine Components for the Airbus A320neo

15 % less fuel consumption – this is the primary benefit that the manufacturer Airbus wants to give customers with its A320neo, a new short- and medium-haul aircraft. Achieving the goal requires, above all, more efficient engines. MTU Aero Engines is a primary supplier to the US engine manufacturer Pratt & Whitney and plays a key role in Airbus reaching its objectives. In order to remain at the forefront of technology, the Munich-based experts in aircraft engines actively supports the use of innovative production processes. Additive Manufacturing plays an important role here, as shown in the manufacture of borescope bosses - access points for inspecting turbines - a product for which MTU relies on EOS technology.

Challenge

The aerospace sector is one of the most innovative in the world. Airbus applied for over 380 patents for the design of the A380 alone. New materials and technologies that are suitable for series production have an important role to play in this industry for reasons that include cost, weight and function. Because of this, both manufacturers and suppliers are testing the performance capabilities of Additive Manufacturing processes, by which components are produced when a powder is hardened, layer by layer, using a laser.

This method was originally used in the manufacture of prototypes as it allows for the fast production of individual parts. Due to its many advantages, however, the technology has since established itself as a staple in series production. The advantages associated with this process include increased design freedom as well as a wide range of useable raw materials, from extremely light, fire resistant/flame retardant plastics to a variety of metals. Generally, the moment an aircraft takes to the skies, both cost and safety pressures become significant driving forces. It is therefore important to choose the right middle ground when introducing new technologies. MTU Aero Engines, Germany's leading engine manufacturer, took a strategic step-by-step approach towards the use of Additive Manufacturing.

The company currently uses seven EOS machines. "About ten years ago, we began with the manufacture of tools and development components," says Dr. Karl-Heinz Dusel, Director of Rapid Technologies at MTU. "In order to optimise capacity utilisation and implement our phased plan, we went in search of further areas where we could apply the technology." The principal challenge consisted of cost and safety considerations on the one hand, and the pursuit of strategic innovation on the other.

Solution

Borescope bosses will be used on the latest generation of engines – the Geared Turbo Fan (GTF) – and they will be manufactured using EOS machines. “At the beginning of the second phase we started to produce raw components, which replaced existing parts. The bore□scope bosses for the low-pressure turbines of the A320neo-GTFs fell into this category,“ explains Karl-Heinz Dusel. These small add-on components allow techni□cians to check the condition of turbine blades inside the engine using endoscopes. The parts are riveted to the turbine housing to create an opening for the endoscope, which in the aerospace sector is termed a borescope.

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Heat resistance and durability are the key characteristics of the nickel-based alloy that was used. This high-quality material achieves the best results demanded by the component, but it is difficult to machine. Fortunately, a problem like this is easily overcome with Additive Manufacturing. As MTU is also a producer of raw materials, the company was able to develop a new process chain, which has been approved and integrated into the manufacturing system.

The entire manufacturing process is underpinned by a control system specifically developed by MTU. Online monitoring captures each individual production step and layer. In addition, new quality assurance procedures were introduced, such as optical tomography. The German Federal Aviation Authority even certified the EOS machines. In the past, the borescope bosses were cast, or milled from a solid, but the low-pressure turbines for the A320neo's Geared Turbo Fan are the first turbines to be serially equipped with borescope bosses produced using Additive Manufacturing. Above all, it was the cost advantages of the EOS technology that were the decisive factor, both in the production itself and in the development stages.

Results

The strategic approach paid off for MTU, as did the close and positive collaboration with EOS. Preparations for the series production of the borescope bosses have now begun. 16 parts per job are envisaged, totalling up to 2,000 parts per year. The savings in percentage terms, compared to previously established processes, is expected to be in double figures and quality is already at a high level. MTU and EOS are working together to further optimise the finishing for the component, especially the smooth surfaces, with the aim of achieving perfection in the structural mechanics. For Dusel, the advantages are clear: "The EOS technology is characterized by its virtually unlimited design freedom and the significantly shortened development, production and delivery times. In addition, development and production costs are drastically reduced. Components of lighter weight and greater complexity can be made a reality and production requires less material and minimal tools."

MTU sees a lot of potential for the manufacture of further series components for aero engine construction, such as for bearing housings or the blades for turbines – both of which need to meet the highest demands in terms of safety and reliability. MTU's aim: Within 15 years a significant proportion of components should be manufactured using industrial 3D printing. The EOS technology thus contributes to the competitiveness of the company, which is active in one of the most demanding sectors in the world

"The Additive Manufacturing of borescope bosses for series production has been a great success. Once again this proves MTU's commitment to innovation leadership. We produce one of the world's most advanced engines – the Geared Turbo Fan – with some of the world's most advanced processes."
Dr. Karl-Heinz Dusel, Director of Rapid Technologies at MTU

How to Choose the Best Parts for LPBF Printing

Laser Powder Bed Fusion (LPBF) is a metal 3D printing technology that can create complex and high-performance parts for various applications. However, LPBF is not a one-size-fits-all solution for every part and every industry. Some parts may be more suitable for LPBF than others, depending on factors such as Geometry, Material, Function, Quality, and Cost. Therefore, it is important to identify the right set of parts to begin the additive journey for LPBF. Choosing a wrong part can result in disdain for technology, missed opportunity, cost and wasted resources. However, the right set of parts with correct business cases can enable a profitable Metal Additive Manufacturing journey.

What are the benefits of LPBF printing?

LPBF printing has many benefits that can make it an attractive option for producing metal parts.

Design Freedom: This can enable new functionalities, improved performance, and reduced weight and material usage.

Material Diversity: Multi-material technologies enable functional grading and getting better performance.

Part Consolidation: With LPBF printing create parts with fewer components, simplifying assembly and supply chain while improving reliability and durability.

Customization: LPBF printing enables mass customization at much lesser price point

Lead Time Reduction: LPBF enables on demand printing once the digital inventory of the parts has been created.

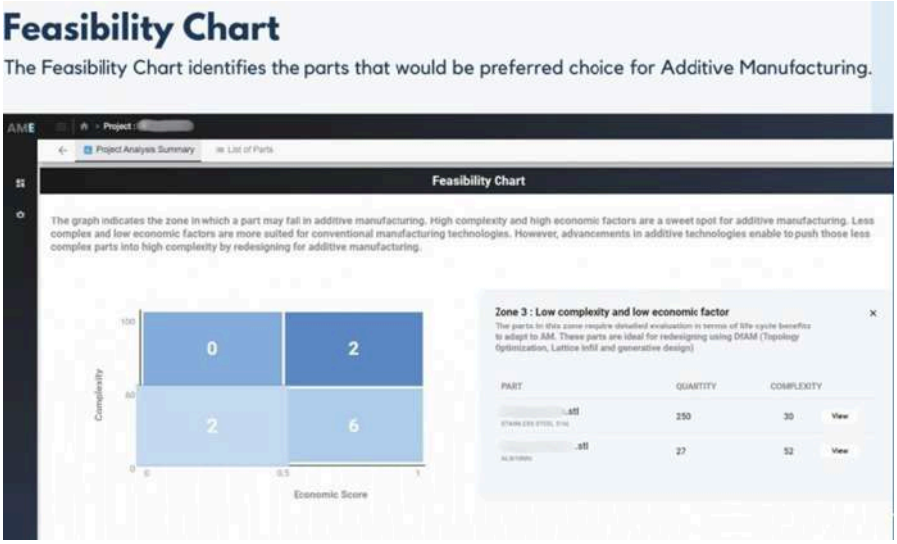
The above benefits may not be applicable for all parts of customers inventory, also it requires a lot of expertise across departments like design, planning, metallurgy and customer facing teams. A software that enables to get the above benefits will enable scaling of additive manufacturing in organizations.

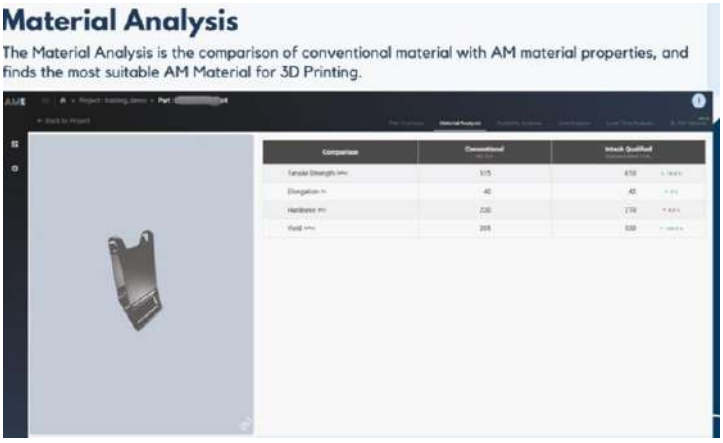
How to choose the best parts for LPBF printing?

To choose the best parts for LPBF printing, it is important to consider the following factors:

Geometry: The geometry of the part affects its printability and quality in LPBF printing. Parts with complex shapes, internal features, lattice structures, or topology optimization are more suitable for LPBF printing than parts with simple shapes or external features.

AMExplorer, a software suite from Intech has a method to identify the complex geometries that make sense for metal additive manufacturing. It indicates a complexity score of 0-100 for every part, enabling customers to understand complexity. The software analyses complexity metrics from variety of factors like curvature, internal channel detection, external shape analysis etc.





Material: The material of the part affects its availability and cost in LPBF printing. Parts with materials that are compatible with LPBF printing are more suitable than parts with materials that are incompatible or unavailable.

Parts with materials that have high melting point, low thermal conductivity, high thermal expansioncoefficient, or high viscosity may require higher laser power or lower scan speed to achieve full meltingor avoid balling in LPBF printing.

AMExplorer has a featureto identify the closest available AM material comparedto defined conventional material and indicates the material properties difference.

Suitability: In the portfolio of parts, some parts are very much suitable for additive manufacturing. Certain parts require some modification before they can be made suitable for additive manufacturing. And some partsmay not be suitable for additive technology due to limitations in part size, part features, etc.,

AMExplorer does a parsingof customers portfolioto identify partsmost suitable for additive manufacturing by analysing features in the part.

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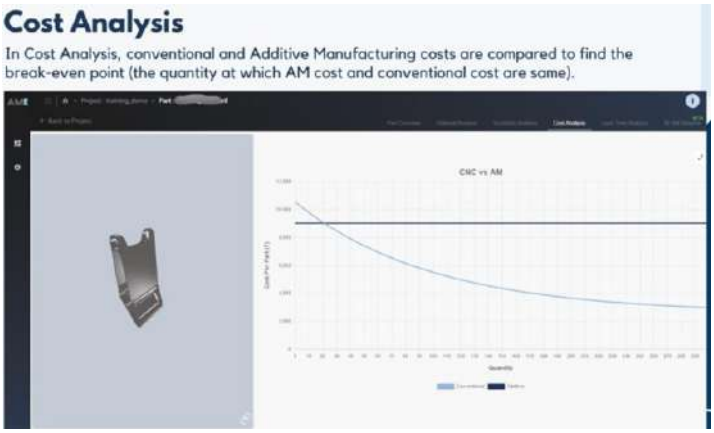


Cost: The cost of the part affects its profitability and feasibility in LPBF printing. Parts with high value-added features that justify thehigh investment and running costs of LPBF printing are more suitable than parts with low value-added features that do not justify the high investment and running costs of LPBF printing.

Parts with high value-added features may include complex geometries, customized features, integrated components, or improvedperformance in LPBF printing.

AMExplorer enables customers to understand the cost trade-off between conventional and additive manufacturing and helps make an informeddecision on the same.

Conclusion:

LPBF printing is a metal 3D printing technology that can create complex and high-performance parts for various applications. It can also help cut costs for existing parts. Identification of the right parts is the first step in this journey. Once the correct parts are identified, there is a need to understand distortions, re-design for additive manufacturing, printing the part, qualification, functional testing, production and continuous cost improvements. The overall benefits of additive manufacturing can be obtained for organisations through correct use of software, collaboration with industry experts and high-quality machines.

Intech Additive with its expertise in machine building, software development capabilities and partner enablement programs enable organisations to get maximum benefits during their additive journey.

Please visit the link or follow the QR code to learn more about Intech Additive.

AMExplorer
https://software.intechadditive.com/AMExplorer

iFusionMachine
https://www.intechadditive.com/hardware-lf1

Contact us page -
https://www.intechadditive.com/contact-us

About Intech Additive Solutions:

We at Intech have been at the forefrontof innovation that can transform the Manufacturing Industry.Our expertise in Hardware, Software and Design (DfAM) makes us one of the very few all-encompassing AdditiveManufacturing Solutions companies in the world. Our missionis to enable faster adoptionby keeping innovation alive and enabling digital transformation through additive technology in a sustainable way.

About the Author:

Ajay Bharadwaj has about 17+ years'experience in semiconductor and software industry. In Intech, he is combining the engineering expertise in building softwarethat make it easier for customers to embrace additive manufacturing. He is responsible for software development and softwareproduct management activities at Intech Additive.

AMSI ADDITIVE MANUFACTURING SOCIETY OF INDIA

W3DP Indian Women in 3D Printing

INDO-MIM® COMPLEXITY SIMPLIFIED

Tool Steel M2 Grade Powder for Binder-Jet 3D printing

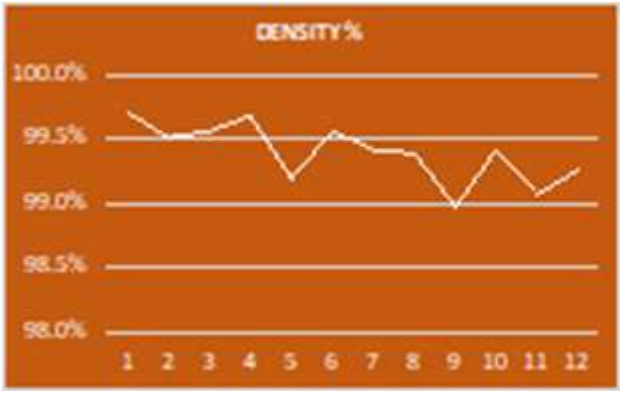
Tool inserts have been 3D printed using LPBF (Laser Powder Bed Fusion) 3D printing route for over a decade. However, laser-based 3D printing process has some inherent disadvantages. LPBF process is too slow and offers only Maraging Steel for the tool insert application. This material can at the best get to 55 HRC post heat treatment making is unfavourable for many tooling applications

Binder-Jet 3D printing offers ~5 times faster printing speed compared to LPBF 3D printing. INDO-MIM developed Tool Steel M2 grade material for Binder-Jet 3D process. We have been printing tool inserts since mid-2022. Currently 800+ mold inserts for Metal Injection Molding are running in production.

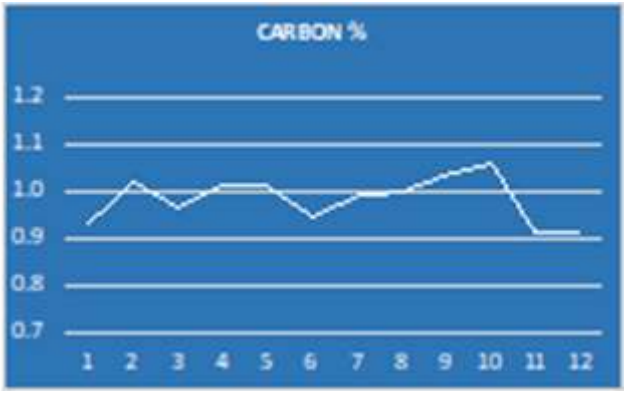
Given our material development and sintering expertise fine-tuned over 25+ years, our M2 Grade material offers 50%~80% increase in the wear resistance, 40% better machinability compared to conventional wrought M2 material. These are accomplished through finer grain microstructure and 99% minimum density post sintering. Our M2 material can guarantee 63~66 HRC hardness consistently.

Material properties at a glance:-

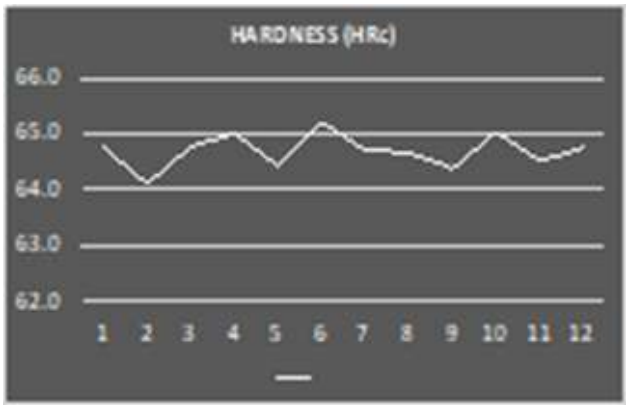
Density %



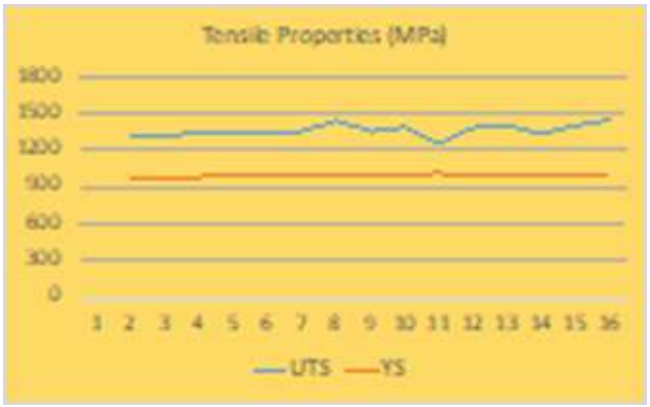
Carbon %



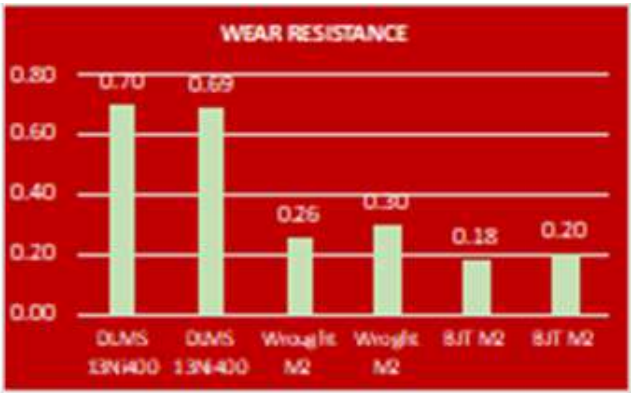
Hardness (HRc)



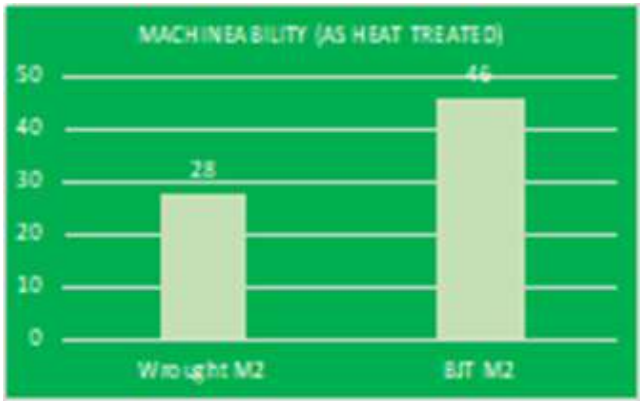
Tensile Properties (MPa)



Wear Resistance



Machinability



The icing on the cake is provided through 360 deg design freedom provided by Binder-Jet 3D printing. INDO-MIM can print tool inserts weighing between 300 grams to 8 kgs to near net shape including complex conformal cooling channels. Polish ability on our M2 material is on par with conventional tool steels.

INDO-MIM can ship tool inserts to your doorstep within 2 weeks max. This includes heat treatment. If you wish, we can finish the tool inserts to your final print utilizing our large in-house tool room in additional two weeks. Feel free to send your RFQ to InfoHQ@ind-mim.com for quick feedback.

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UPCOMING EVENTS

W3DP
Indian Women in 3D Printing

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