

PLATFORM



A Roundtable webinar meeting with a think tank of policy makers, Government bodies, industry experts, scientist, manufacturers, OEM's, Aerospace Cos, Design Companies, Engineering Companies, Consultants, and 3D Printing cos.

3D Printing World *Think Board* - Aerospace & Defence 2020

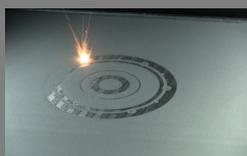
Topic : “3D Printing technology for Aerospace & Defense Industry - Creating business opportunities in the COVID times ”

Platform : 3D Printing World Think Board - Round table webinar on 3D printing subject for different industry.

Dated : 10th July 2020

Time : 9.00 am to 12.15 pm

Participants : Policy makers, government bodies, OEM's, Aerospace cos, Defense cos, Design Companies, Engineering Companies, R & D Department, Tool manufactures, Quality Certification agency, Scientists, Metallurgist, Material Scientist, Research Institute, Consultants, Software Cos, 3D Printing Solution providers, 3D Printer cos, 3D Printer Cos, Material cos and others.



Organiser



3D Printing Association Partner



Industry Association Partner's





Dear Respondents,

It gives me immense pleasure to share the potential of a Game Changing technology called 3D Printing. This is indeed a unique technology which is benefiting almost all sectors. And since we are operating in a digital world a technology like this can only help change the dynamics of manufacturing with tool making to benefit the end users.

The technology is also called Additive manufacturing, Rapid Prototyping and **DIGITAL MANUFACTURING**. How does this operate? In 3D printing, the first step is to make a virtual design of the desired object, and subsequently the virtual design is made in a CAD file by using a 3D scanner or by using a 3D modeling program with a software. The next step is to get the 3D file to print it; the 3D modeling software in the 3D printer will "slice" the design into numerous layers, and uses the material to create the object layer by layer. It is a process of making 3D objects using plastic, metal, ceramic, wood, gold powder and composite materials, usually layer upon layer, to build physical models, prototypes, patterns, tooling components, and production parts. There is a great deal of R & D going into the various materials to ensure it can be used for various requirements. **It is estimated that the global 3D printer market will grow at a CAGR of 18.65 in the next 5 years from 2020 - 2025.**

Industries & Sectors benefiting from the technology are Aerospace, Defense, Space, Medical – Dental, Maxillofacial, Craniofacial, Cosmetic Surgery, Medical equipment's, Orthopedics and Bio-printing (printing body parts, organs and tissue), Automobile, Engineering, Tools, Architecture, Construction, Oil & Gas, packaging, consumer products, Jewelry, Fashion, Design, Food, Art, Entertainment and education. And to create the awareness **Trinity Media & Marketing Solutions** have taken a conscious effort to educate and disseminate the technology to each sector through various platforms to promote it.

Trinity Media & Marketing Solutions is a media company promoting new emerging technologies like 3D printing, Artificial intelligence and blockchain. We have created many platforms addressing each technology and industry www.trinitymediams.in

Specifically, here for 3D Printing we have created platforms too. **3D PRINTING WORLD** is our main platform - www.3dprintingworld.in **The theme is 3D Printing World – “3D Printing for All – Creative Imagination made real”**

Under the main platform we have many other platforms with initiative's –

3D PRINTING WORLD THINK BOARD is one of the platforms among the others which is a roundtable meeting webinar series with thinkers, industry experts, initiators, sector representatives, 3D printing solution companies to join for sharing the knowledge and wisdom about the technology. A great opportunity for knowledge, networking and business. It will also create a thought leadership for companies offering solutions in the 3D Printing technology, machines, design and software.

3D Printing World Community Club: A strong consortium of leaders and respondents from each industry and 3D Printing companies join to learn and be updated of the technology. Details for membership is in the weblink : <https://3dprintingworld.in/community-club.html>

Under the current situation of COVID 19 we take the opportunity to host a **3D Printing World Think Board – Aerospace & Defense 2020** webinar with the topic - **“3D Printing technology for Aerospace & Defense Industry – Creating business opportunity in the COVID times ”.**

Thanking You,

Dr. Shibu John,
Founder, Trinity Media & Marketing Solutions
Secretary General & Founder,
3D Printing Education & Research Association.



“3D PRINTING TECHNOLOGY FOR AEROSPACE & DEFENCE INDUSTRY – CREATING BUSINESS OPPORTUNITIES IN COVID TIMES”

Tentative List of Chief Guest & Guest of Honor with Eminent Speakers



Shri. Dr. Ajay Kumar,
Defence Secretary,
Ministry of Defence,
Govt. of India



Shri. Dr. Satheesh Reddy,
Chairman,
Defence Research & Development Organisation,
Govt. of India



Shri. R Madhavan,
Chairman,
Hindustan Aeronautics Ltd,
Govt. of India



Dr. Shibu John,
Founder, Trinity Media,
3D PRINTING WORLD,
Secretary. General & Founder- 3D
PRINTING EDUCATION & RESEARCH
ASSOCIATION



Shri. Bharat Malkani,
President,
MRO Association of India
Founder,
Max Aerospace & Aviation Pvt Ltd.



Shri. Raman Sopory,
President,
ADCAI (Aerospace & Defence
Consultants Association of India)



Dr. U Chandrasekhar,
Program Director,
Wipro 3D



Dr. Prakash Mugali,
Founder, Enerzi
Group



Anand Prakasam,
MD,
EOS India



Rafiq Somani,
Country Manager,
South Asian, Pacific,
ANSYS Software Pvt Ltd



Rajiv Bajaj,
MD,
Stratasys India



Saroop Chand,
Director,
Adroitec



Deelip Menezes,
MD,
3D Systems India



Sanjay Gupta,
Director,
Global Axis



Yathiraj Kasal,
GE Additive,
Addworks, APAC



Dr. Ramakrishna, Chairman,
International Advanced
Research Centre, Powder
Metallurgy



Current updates about 3D Printing in Aerospace & Defense Industry -

The Aerospace and Defense (A&D) industry is a great example of utilization Additive Manufacturing (AM) (commonly referred to as 3D Printing) with a clear value proposition and the ability to create parts that are stronger and lighter than parts made using traditional manufacturing.

The A&D industry was a very early adopter of 3D printing and still continues to contribute heavily to its development. Some aerospace companies began using this technology as early as 1989 and over the next couple of decades, the adoption of 3D printing increased substantially. In 2015, the Aerospace & Defense industries contributed approximately 16% of 3D Printing's \$4.9+ billion global revenues.

A whopping 75% of industry leaders believe that 3D Printing will become standard within the defense industry in the next 10 years, according to a study by Defence IQ. Clearly, as in other industries, 3D printing is making its case within defense and military fields. Additive manufacturing has the potential to transform the defence industry, providing new ways to 3D print replacement parts on demand, whilst reducing production costs and enabling new design engineering possibilities.

3D printing is implemented at all stages of the design workflow for applications in the aerospace and Defense industry.

Advantage of the 3D printing in Aerospace –

Design communication

Designs in the aerospace industry often begin as concept models showcasing a component of an aircraft. These are often also regularly used for aerodynamic testing, which is of critical importance for aerospace. SLA and Material Jetting are used to produce high detail, smooth, scale models of aerospace designs. Accurate models allow design intention to be clearly communicated and showcase the overall form of a concept.

Validation stage

Prototyping using 3D printing is now commonplace in the aerospace industry. From a full-size landing gear enclosure printed rapidly with low-cost FDM, to a high-detail, full-color control board concept model, there is a 3D printing process suited to every prototyping need. Engineering materials for 3D printing also allow for full testing and validation of prototype performance.

Pre-production

One of the areas 3D printing has been most disruptive and valuable is the production of low-cost rapid tooling for injection molding thermoforming and jigs & fixtures. Within the aerospace industry, this allows for tooling to be quickly manufactured at a low cost and then used to produce low to medium runs of parts. This validation mitigates the risk when investing in high-cost tooling at the production stage and can also provide production components for quantities up to 5,000 to 10,000 parts.



Production

Because production volumes in the aerospace industry are generally large (more than 70,000 parts per year) 3D printing has predominantly been used in the past as a prototyping solution rather than the manufacturing of end parts. Improvements in the size of industrial printers, the speed they are able to print at and the materials that are available mean that 3D printing is now a viable option for many medium-sized production runs, particularly for high-end interior build-outs.

Customization

3D printing technologies have a significant impact on the aerospace industry when the cost of highly complex one-off components can be justified by a substantial improvement in aircraft performance: the average corporate aircraft travel 75,000 miles per month and a single component that was designed and manufactured with 3D printing reduces air drag by 2.1%, reducing fuel costs by 5.41% Small adjustments like this example affect life in a huge way.

Parts can be tailored to a specific aircraft (custom, lightweight bracketry) or type of aircraft (cargo, passenger or even helicopter). 3D printing also provides part consolidation and topology optimization of many custom aerospace components.

Jigs & Fixtures

Big benefits exist for some of the more mundane 3D printing applications, including Jigs & Fixtures making. For each individual aircraft, companies have hundreds of fixtures, guides, templates, and gauges 3D printed, generally with 60 to 90 percent reductions in cost and lead time compared to other manufacturing processes.

Surrogates

Surrogates are placeholder parts used throughout production that represent components that are later installed in final assemblies. Surrogates are mainly used for training. NASA and several air force bases commonly use surrogate parts on the production floor.

Advantages of 3D printing in Defense -

1. Faster product development

Additive manufacturing significantly speeds up the design process, since it requires no tooling. In contrast, traditional manufacturing can take months to produce the necessary tools to create end parts and prototypes. The defence industry can therefore take advantage of the technology to bypass costly and time-consuming tooling, thereby reducing the time required for product development.

2. Freedom of design

The defence industry can also capitalise on the ability of 3D printing to produce freeform, optimized objects. This means that the weight of a part can be significantly reduced using additive manufacturing, saving material costs and production time. Leveraging advanced design tools,



design engineers can reduce the number of components in an assembly to just one, and thus greatly simplify the assembly process.

3. Customised equipment

Not only does 3D printing allow for more design freedom, but it also offers the opportunity to create customised parts, tailored for specific functions. Rather than carry parts and pieces for all possible configurations, soldiers can use 3D printing systems to manufacture parts on demand. For example, researchers in the Army can now 3D print customized drone airframes tailored to the specific needs of a given mission. Customisable 3D printable designs are therefore vital to achieving greater levels of agility and flexibility within the military.

4. Localised and on-demand production

Coordinating logistics and transportation makes up a significant part of any military budget. For an industry that spends billions of dollars on logistics alone it may prove to be more cost-effective to print custom parts, tools and spare parts near the point of use – a solution that additive manufacturing provides. This could mean that soldiers in remote areas can also use 3D printing to their advantage. This has already been tested to some extent: back in 2012, the US army used an additive manufacturing facility in Afghanistan to print spare parts much more quickly than procuring them.

Challenges:

Quality assurance -

Although Aerospace and Defence with military prototypes can be 3D printed quickly and cheaply, wider implementation of additive manufacturing for the production of end parts still faces a number of challenges.

One of the main concerns for the Aerospace & defence industry is quality assurance, as all parts must adhere to stringent performance requirements. Before additive manufacturing can be further integrated into the production of end parts, Aerospace & Defence industry must be assured of the repeatability and accuracy of the AM production process. Currently there are no fully defined industry standards for 3D printed parts in the Aerospace and defence industry. It is crucial to establish a comprehensive set of standards to govern 3D printing processes and qualify printed parts.

We have found the developed nations like, the US Department of Defence which has already developed an additive manufacturing road map, which is set to enable even larger uptake of the technology within the military. Automation software will also be vital in ensuring that this process remains transparent and repeatable and provide a comprehensive production management.

Digital security –

If the Aerospace & Defence military is to use additive manufacturing for on-demand, localised production, it will be vital to ensure the security of the digital CAD files. This will require additional digital security measures to ensure files cannot be accessed externally, and digital supply chains remain secure.



Trinity Media & Marketing Solutions a media company has recognized the potential of this technology to invite experts from Aerospace & Defence to our 3D PRINTING WORLD THINK BOARD a Roundtable meeting conference webinar for thinkers, initiators from Policy, Government, Association, and respective industry from Aerospace Component manufactures, OEM's, Aerospace Cos, Design Companies, Engineering Companies, R & D Department, Tool manufacturers, Scientists, Research Institute, Consultants, Software Co.s, 3D Printing Solutions providers, 3D Printer Manufacturers and others..

The event will be deliberated on below key points –

1. 3D Printing a Game Changer - Efficiency, Speed, reliability for Aerospace & Defense Industry. Detailed discussion by experts,
2. How is the Aerospace & Defence industry going to utilize 3-D printing technology – Pre & Post lockdown?
3. How will it help the industry during the current period? Challenges & Opportunities.
4. What advantages does the technology provide to OEM's?
5. What advantages does it provide to Designers, Engineering Companies, Component and Tool Manufacturers?
6. A Feasibility report and study.
7. What is it for new aspirants and SME companies?
8. Benefit for larger proliferation and learning starting to ensure it is sustainable and helps the current economic crisis.
9. Creating more business and Start up's to created Entrepreneurship and Jobs.
10. 3D Printing Training courses to be instituted in all the Engineering and institutes for learning and career opportunities
11. A proper standard validation and certification agency to be accorded by the government agency ensuring the technology with materials can be suitable for larger production.
12. 3D Printing Education & Research Association to work with industry associations in Aerospace & Defence to work in confluence with the government for larger development – A discussion on the subject.

Event Date: 3rd July 2020

Time	Event Flow
9.00 am - 9.05 am	Welcome address by the Organizer – Dr. Shibu John, President, 3D Printing World, CEO & Founder, Trinity Media & Marketing Solutions
9.05am - 9.10 am	Introduction of the 3D Printing World THINK BOARD – Aerospace & Defence 2020 Topic - "3D Printing technology for Aerospace & Defense Industry - Creating business opportunities in the Covid times"
9.10 am – 9.20 am	Introducing the CHIEF GUEST'S
9.20 am – 10. 20 am	SESSION 1 - Speakers with their sub-topic (To be decided)
10.20 am – 10.45 am	Q & A
10.45 am - 11.45 am	SESSION 2 - Speakers with their sub-topic (To be decided)
11.45 am – 12.00	Q & A

12.00 pm – 12.10 pm	3DPW – Business Connect - Introducing business reference
12.10 pm – 12.15 pm	Closing of the event.



ORGANISER



Trinity Media & Marketing Solutions (TMMS) is a Media & Marketing company as a consortium started in the year 2014 offering consultancy, Affiliate Marketing services, Media solutions, IP's, Concepts with publication and events. We are a CRISIL rated agency. We identify new emerging technologies to proliferate it to a large audience through various media platforms designed through our media expertise. We also promote Contractual Sales & Promotions for tangible/intangible (concepts) products, New technologies, PR, Media tie-ups, B2B/ B2C Exhibitions, Conferences, Digital media and Intellectual Property formulation.

TMMS acts as a Catalyst to be an end to end solution provider for Clients, Stakeholders and Partners in India and Globally. We also partner with Association and trade bodies to conceptualize events working in confluence to benefit the association and its members across categories and industry.

Trinity Media & Marketing Solutions is currently promoting Artificial Intelligence (AI) and 3D Printing.
www.trinitymediams.in

ASSOCIATION PARTNER



3D PRINTING EDUCATION & RESEARCH ASSOCIATION is a non-profit organisation founded in 2019 by a group of researchers, Academicians, Doctors, Scientist, Engineers, Designers, Software cos, Additive Manufacturing companies and technology companies. The intent of forming this association is to recognise 3D printing technology as an industry across sectors in India. The Association will align with all the policy makers from each Ministries of the Government of India to get the technology its presence and importance initiated for recognition in each of the sectors. The Association will also be a catalyst as a global representation in Research, development, education, skill development, Human resource, Training with new initiatives, which will benefit all the sectors. The sectors of focus will be Dental, Maxillofacial, Prosthesis, Orthopedic, Medical devices, Tissue Engineering, Lifescience, Pharma, Aerospace, Defence, Engineering, Electronics, Automobile, Tooling, FMCG, Architecture, Oil & Gas, Manufacturing, Construction, Design, Jewelry, fashion, Art, Entertainment, Education, research and other relevant industries benefiting from the technology.

3DPERA will also evolve as an integrated platform for all the major industry associations in India and Globally to work with them for benefiting their respective industries. We would also include start-ups and enterprises with a focus to push the industry forward by evangelizing the concept of Additive Manufacturing in India. The association is aimed to bring together all stakeholders to a common platform and promote overall growth of Additive manufacturing technology. Education, Research and development is also the prime focus



of the association, which will institute a conscious effort in working closely with the respective research institutions and scientist to develop new means and methods to achieve the best in class materials, machines, software and other prerequisites.

SLOGAN OF 3DPERA : “Excellence in Education & Research benchmarking industry growth”

www.3dpera.org

INDUSTRY ASSOCIATION PARTNER



Aerospace & Defence Consultants Association of India is a team of experts in Aerospace, Defence & Offset business in India and Globally.



Established in 2013, MRO Association of India (MAOI) is a non-profit apex professional society which represents the interest of all its members to bring to fore the issues to various Government bodies and regulatory authorities whilst working towards development of MRO as an industrial sector in India. Its members include all MRO service providers including Airlines in the country which include DPSU, PSU and the Private Sector.

<http://www.mroassociation.in/>