



Centre for Joint Warfare Studies & Indian Military Review present

ADVANCED MATERIALS FOR DEFENCE & AEROSPACE

Seminar & Exhibition | 22 Nov 2023 | New Delhi

INDIAN MILITARY REVIEW

IMR

Knowledge Partner



Special Steels

- Maraging Steel
- Stainless Steel
- Tool Steel
- Armour Steel
- Inconel Steel
- High-speed Steel

Titanium and Alloys

- Airframe structures
- Engines
- Landing gear
- Armour
- Missiles
- Spacecraft
- Naval Applications
- Fuel tanks

Aluminum Lithium

- Airframe structures

- Engines
- Landing gear
- Missiles
- Spacecraft
- Fuel tanks
- Drones and UAVs
- Armament systems

Carbon Fibres

- PAN-based carbon fibres
- Pitch-based carbon fibres
- Rayon-based carbon fibres
- S-glass/E-glass hybrid Carbon Fibres
- Boron fibres
- Aramid and Graphite fibres

Graphene

- Sensors
- EMI shielding
- Thermal management

- Fuel cells
- Armour
- Batteries
- Composites

Composites and polymers

- Aircraft structures
- Space systems
- Armor systems
- Drones
- Optics
- Fuel and fluid systems

Additive Manufacturing/ 3D Printing

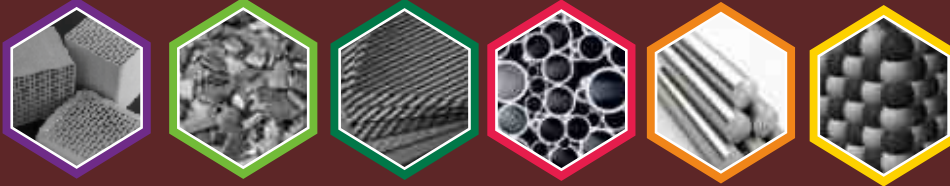
- Prototyping and design verification
- Tooling and jigs
- Weapon and armament systems
- Space systems

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ADVANCED MATERIALS FOR DEFENCE & AEROSPACE

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The Centre for Joint Warfare Studies and Indian Military Review are organising Advanced Materials for Defence & Aerospace 2023 seminar & exhibition on 22 Nov 2023 at the Manekshaw Centre, New Delhi.

Steel, copper, aluminium, titanium, cupronickel, tungsten, composites, and ceramics are the primary metallic/non-metallic material groups used in aerospace and defence production. These elements are combined with other metals, including nickel, cobalt, vanadium, zinc, antimony, molybdenum, borates, chromium, germanium, and lithium, to create specialised alloys. These alloys are then machined into the necessary shapes and sizes after undergoing specific treatments such as forging and casting to make them lighter, stronger, and blast-resistant.

India imports \$2 billion in essentials annually, according to estimates. Most Indian defence businesses, DPSUs, and DRDO labs import raw materials. HAL, the largest DPSU, imported raw materials worth Rs 3,629.4 crore (\$ 500 million) in 2018-19. Six Indian defence businesses imported high alloy steel worth Rs 5250 crore in 2018-19. (\$700 million). India produces composite components from glass, carbon, and aramid fibres, but not Kevlar or aircraft-grade carbon fibre.

Indigenous systems like the Light Combat Aircraft (LCA) Tejas Mk 1A, which has a 45 percent carbon composite airframe, rely heavily on imports. Light Combat Helicopters (LCH), Advanced Light Helicopter (ALH) Dhruv, Medium Weight Fighter (MWF) Tejas MK 2, and fifth-generation Advanced Medium Combat Aircraft (AMCA) will utilise carbon composite airframes (AMCA).

Military material and alloy suppliers have another challenge: obtaining authorised sources. Getting sourcing certification for numerous suppliers to increase volume and lower unit cost is difficult.

Technology Perspective and Capability Roadmap (TPCR) of April 2013 says: "Advances in nanotechnology will drive the next paradigm shift in military capabilities. Carbon composites, metal matrix composites, stealth coatings, self-healing materials, adaptive camouflage materials and structures and smart skin materials shall be the main structural materials for the future combat and support systems. Capability for development of Micro Electro Mechanical System (MEMS) based sensors, actuators, RF devices and focal plane arrays would also need to be developed.

The field of advanced materials in defense and aerospace applications is evolving. Some of the latest developments in advanced materials include Carbon Nanotubes (CNTs), Graphene for next-generation aerospace materials, Additive Manufacturing (3D Printing) is transforming the production of components and structures, Ceramic Matrix Composites, Shape Memory Alloys, smart materials and Bio-inspired Materials are changing the scenario.

Advanced Materials

Widely use in Defence & Aerospace applications.

- Aluminum Alloys
- Titanium Alloys
- Stainless Steel
- Nickel-Based Superalloys
- Cobalt-Based Superalloys
- High-Strength Steel Alloys
- Composite Materials
- Tungsten and Tungsten Alloys
- Beryllium
- Magnesium Alloys

Aerospace

Common advanced materials and their purposes/functions in fifth-generation fighter jets are:

- Carbon Fiber Reinforced Polymers (CFRP)
- Titanium Alloys
- Ceramic Matrix Composites (CMCs)
- Stealth Coatings
- Advanced Aluminum Alloys
- Graphene-Based Materials
- Advanced Ceramic Materials
- Advanced Stealth Composites

Land Systems and Missiles

Advanced materials for construction of warships and submarines:

- High-Strength Steel
- Aluminum Alloys
- Composite Materials
- Titanium Alloys
- Non-Skid Decking
- Advanced Ceramics
- Acoustic and Sonar Materials
- Fiber Reinforced Polymers (FRP)

Land Systems and Missiles

A wide variety of advanced materials are utilized in artillery guns, battle tanks, and missiles. Here are some of them:

- High-Strength Steel
- Composite Armor
- Reactive Armor
- Ceramic Materials
- Titanium Alloys
- Advanced Propellant Materials
- Advanced Guidance System Materials
- Composite Materials for Missile Airframes

Recent Developments in Advanced Materials

Some of the latest developments in advanced materials for defense and aerospace include:

- Carbon Nanotubes (CNTs)
- Graphene
- Additive Manufacturing (3D Printing)
- Ceramic Matrix Composites (CMCs)
- Shape Memory Alloys (SMAs)
- Bio-inspired Materials
- High-Performance Composites



ADVANCED MATERIALS FOR DEFENCE & AEROSPACE SEMINAR PROGRAMME Wednesday, 22 Nov 2023

SESSION 1 – INAUGURAL SESSION (0930 – 1040 hrs)

Welcome Address	Lt Gen Sunil Srivastava , AVSM, VSM**, Director, CENJOWS
Inaugural Address	Dr Samir Kamat , Secretary DD R&D and Chairman DRDO.
Keynote Address.	Lt Gen Manjinder Singh , YSM, VSM, DCIDS (PP & FD), HQ Integrated Defence Staff.
Special Talk.	Maj Gen CS Mann , VSM, Addl DG Army Design Bureau.
Industry Perspective	Col KV Kuber , Director Defence & Aerospace, Ernst & Young.
Release of Report	EY-IMR Knowledge Paper on Air Defence.
1045 – 1115 hrs	Refreshment break and exhibition.

SESSION 2 – ADVANCED MATERIALS FOR AEROSPACE (1115–1240 hrs)

Chairperson:	Air Vice Marshal Yalla Umesh VSM, Asst Chief of Air Staff (Engineering A), Air HQ
1115 – 1130 hrs	Introduction of speakers and Opening Remarks by the Chairman.
1130 – 1140 hrs	Stealth Materials, Components and Technologies for Aero applications. Prof Ravi Sankar Kottada , Metallurgical & Materials Engineering, IIT-M.
1140 – 1150 hrs	Superalloy Casting Technologies For Aero Gas Turbine Engine Applications. Sh Alok Singh Chauhan , DMRL, DRDO.
1150 – 1205 hrs	Industry Presentation. Mr Srinath Ravichandran , CEO Agnikul Cosmos.
1205 – 1220 hrs	Industry presentation.
1220 – 1235 hrs	Q&A.

SESSION 3 – ADVANCED MATERIALS FOR LAND SYSTEMS, MISSILES AND NAVAL APPLICATIONS

Chairperson:	Rear Adm K Srinivas , Asst Chief of Materials (Dockyards & Refits), Naval HQ
1235 – 1250 hrs	Introduction of speakers and Opening Remarks by the Chairman.
1250 – 1300 hrs	Special materials for ship and submarine building. Cdr BK Singh , DND (SDG), Naval HQ.
1300 – 1315 hrs	Latest development in /Impact absorbing Body Armour. Prof Ghosh , CME Pune.
1315 – 1330 hrs	Panel discussion.
1330 – 1430 hrs	Lunch and exhibition.

SESSION 4 – SMART & FUTURE MATERIALS/ RARE EARTHS & SEMICONDUCTORS (1430 – 1545 hrs)

Chairperson:	Asst Chief of Naval Staff (Staff Requirements) , Naval HQ
1430 – 1445 hrs	Introduction of speakers and Opening Remarks by the Chairman.
1445 – 1500 hrs	Smart and Future Materials and Rare Earths. Sh Anuttam Mishra , Indian Rare Earths Limited.
1500 – 1510 hrs	Smart polymer, fibre & fabrics for stealth, extreme cold, fire resistant & ballistic protection. Dr Kingsuk Mukhopadhyay , Sc H, DMSRDE, DRDO.
1510 – 1520 hrs	Smart Memory Alloys. Dr. Apurba Sinhamahapatra , CSIR-CIMFR, Dhanbad.
1520 – 1530 hrs	Smart Materials for Future Military Electronics Applications. Sh KNS Pavan Kumar , Scientist B, YSL-Smart Materials, DRDO.
1530 – 1545 hrs	Q&A.

SESSION 5 – ADDITIVE MANUFACTURING AND 3D PRINTING (1545 – 1715 hrs)

Chairperson:	Prof Murugaiyan Amirthalingam , Assoc. Prof, Joining and Additive Manufacturing Lab, IIT-M.
1545 – 1600 hrs	Introduction of speakers and Opening Remarks by Chairman
1600 – 1610 hrs	Additive Manufacturing of Metallic Components for Defence Applications. Sh V Srinivas , Scientist 'E', DMRL, DRDO.
1610 – 1625 hrs	Advanced materials for Metal Additive Manufacturing through Ultrasonic atomization technology. Mr Ram Kumar Krishnan , Intech Additive Solutions.
1625 – 1640 hrs	Application of additive manufacturing in Industries. Mr S Muralishankar , Managing Director, Super Auto Forge.
1640 – 1655 hrs	Q&A.
Closing Remarks.	Lt Gen Sunil Srivastava , AVSM, VSM**, Director, Centre for Joint Warfare Studies
Vote of Thanks.	Maj Gen Ravi Arora , Chief Editor, Indian Military Review.
1715 onwards	Refreshments and dispersal.

Rate Card

DELEGATE PASS

VALID FOR FULL DAY INCLUDES LUNCH

Rs 5,900

Delegate Pass Price includes:

1. Attending all sessions
2. Visit exhibition booths.
3. Interacting with sponsors, exhibitors, speakers & delegates
4. All refreshments and lunch
5. Video link of proceedings after the event.

Transferable and refundable if cancelled 48 hrs before the event.

ECO STARTUP

EXHIBITION BOOTH

LOW COST FEATURE RICH

Rs 118,000

1. One furnished octonorm exhibition booth 2X2M.
2. Company profile 200 words with Logo, contact details in event guide.
3. Half page advt in show guide
4. Two delegate passes
5. Contact data of all delegates and video links after the event.
6. Fascia, logo, 1 table, 2 chairs, carpet, 2 lights, power box, dustbin at booth

PREMIUM BOOTH

FOR MORE FOOTFALLS

Rs 236,000

1. One furnished octonorm exhibition booth 3X3M.
2. Company profile 300 words with Logo, contact details in event guide
3. Half-page advt in Event Guide
4. Three Delegate Passes and three Exhibitor passes
5. Contact data of all delegates and video links after the event.
6. Company Logo at Venue, Lobby and on Stage as Sponsor
7. Distribute one Company literature item in Delegate Bags
8. Fascia, logo, 1 table, 4 chairs, carpet, 3 lights, power box, dustbin at booth.

ADDITIONAL BRANDING OPPORTUNITIES

- Delegate Lanyards (non-exclusive) with Company Logo both sides Rs 118,000
- Registration Sponsor with Company Logos at all counters Rs 118,000
- Luch Sponsorship with Banner Rs 94,400
- Standee banner (3x6ft) at Entrance, each Rs 10,000
- Banner (8x10ft) at Entrance, each Rs 25,000

BRONZE SPONSOR

MULTIPLE BENEFITS WITH SPEAKING AND BRANDING

Rs 354,000

1. Speaking Slot 15 mins
2. 3x3m furnished octonorm booth
3. Five Delegate Passes and three Exhibition staff Passes
4. Full Page Advt in Event Guide
5. Company Profile (500 words with logo, contact details) in Event Guide
6. Two company literature items/gift in Delegate Bags
7. Delegate List with contact details after the event.
8. Video of speakers' presentations after the event
9. Sponsor Logo on event promotion
10. Logo on all marketing materials
11. Banner on Event website
12. Company Logo at Venue, Lobby and on Stage as Sponsor
13. Fascia, logo, 1 table, 4 chairs, carpet, 3 lights, power box, dustbin at booth.

SILVER SPONSOR

MULTIPLE BENEFITS WITH SPEAKING AND BRANDING

Rs 472,000

1. Speaking Slot 15 mins
2. 4x3m furnished octonorm booth
3. Six Delegate Passes and four Exhibition staff Passes
4. Full Page Advt in Event Guide
5. Full Page Company Profile (with logo and contact details) in Event Guide
6. Two company literature items/gift in Delegate Bags
7. Delegate List with contact details after the event.
8. Video of speakers' presentations after the event
9. Sponsor Logo on event promotion
10. Logo on all marketing materials
11. Banner on Event website
12. Company Logo at Venue, Lobby and on Stage as Sponsor
13. Fascia, logo, 2 tables, 6 chairs, carpet, 4 lights, power box, dustbin, magazine rack at booth.

GOLD SPONSOR

MULTIPLE BENEFITS WITH SPEAKING SLOT

Rs 590,000

1. Speaking Slot 15 mins
2. 6x3m furnished octonorm booth
3. Twelve Delegate Passes
4. Full Page Advt in Event Guide
5. Full Page Company Profile (with logo, contact details) in Event Guide
6. Two company literature items/gift in Delegate Bags
7. Delegate List with contact details after the event.
8. Video of speakers' presentations after the event
9. Sponsor Logo on event promotion
10. Logo on all marketing materials
11. Banner on Event website
12. Prominent Company branding at Venue, Lobby and on Stage as Gold Sponsor
13. Buntings on 4 poles at venue.
14. Custom Fascia, logo, 4 tables, 8 chairs, carpet, 6 lights, 2 power boxes, dustbin, 42" LED at booth.

Contact IMR Media for additional furniture, LEDs, customisation an Backdrop flex/ vinyl baneers

IMR Media Pvt Ltd

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