



Wed, 29 April 2020

## DRDO adapts two more bio-warfare technologies to fight Covid-19

The by the Defence Research and Development Organisation (DRDO) has adapted two more technologies developed for bio-warfare applications for detection of COVID-19 in humans.

DRDO sources said two technologies based on immunological detection and gene amplification are being offered to the private industry for development and fast-tracking commercial production.

This is in addition to technology and specifications for a host of other items made available to the industry by DRDO to help in the fight against COVID-19.

According to a senior scientist, the immunological detection technology for COVID-19 is based on the detection of certain types of antibodies present in the human bodies by using antigens.

An antigen is a toxin or other foreign substance which induces an immune response in the body, especially the production of antibodies. The SARS-CoV-2 antibodies present in the human test sample binds to the antigens and the reaction is then analysed through scientific processes to determine the presence of the virus.

The other technology is the “reverse transcription loop mediated isothermal amplification,” which scientists say, is a new generation innovative procedure that detects genomic viral RNA (Ribonucleic Acid) in human samples.

DRDO has listed over 43 items designed and developed by it that can be adapted or modified for use in the fight against COVID-19 and are open for manufacture by the private industry.

These include personal protection gear, virus detection and neutralisation items, shelters, sanitisers and safety gadgets and medical equipment.

<https://www.defenceaviationpost.com/2020/04/drdo-adapts-two-more-bio-warfare-technologies-to-fight-covid-19/>



## **Manufacturing of PPE coveralls ramped up**

*Over 1 lakh units made per day*

Coimbatore: The capacity to produce coveralls in the country has been ramped up to more than one lakh units a day, according to an official press release.

Bengaluru has emerged as the hub for manufacture of Personal Protective Equipment (PPE), accounting for nearly 50% of the production. Other places that have a large number of approved production units are Tiruppur, Chennai, Coimbatore, Ahmedabad, Vadodara, Ludhiana and Bhiwandi. Large-scale garment units in Bengaluru had taken to PPE coverall production in a big way. Some of these companies, that have scale of manufacturing, have invested in additional machinery as well.

A large number of non-woven textile manufacturers in Coimbatore-Erode belt in Tamil Nadu supply fabric to the coverall producers.

The release added that four laboratories in India have the synthetic blood penetration resistance test facilities and necessary approvals to conduct tests and certify body coveralls required for COVID-19.

These are, the South India Textile Research Association in Coimbatore, Defence Research and Development Establishment in Gwalior, and two laboratories under the Ordnance Factory Board — Heavy Vehicles Factory at Avadi and Small Arms Factory at Kanpur.

A unique certification code is generated for the prototype samples sent to these labs by the manufacturers of fabric and coveralls and the results are published on the websites of DRDO, OFB and SITRA. The laboratories now accept the sample of testing only on submission of an affidavit in the prescribed format by the organisation that wants to get the sample tested.

An official at SITRA said the association gets nearly 200 samples a day from different parts of the country.

<https://www.thehindu.com/business/manufacturing-of-ppe-coveralls-ramped-up/article31457319.ece>

## **IIT students develop intubation boxes for Covid-19 patients with breathing problems**

*By Gunjan Sharma*

New Delhi: Students at the Indian Institute of Technology (IIT) have developed low-cost intubation boxes for dealing with COVID-19 patients facing breathing issues and requiring assistance in the form of endotracheal intubation.

Intubation is the process of inserting a tube, called an endotracheal tube (ET), through the mouth and then into the airway. It is done so that a patient can be placed on a ventilator to assist with breathing during anaesthesia, sedation or severe illness.

The device developed by IIT Guwahati functions as an aerosol obstruction box which can be placed atop the patient's bed on the head-side, limiting the flow of virus-laden droplets from the patient to the doctor, especially during the process of intubation.

According to the team, the primary prototype of the design has been completed at the Defence Research and Development Organisation (DRDO) and the box is currently being reviewed at major COVID-19 care centres including at the All India Institute of Medical Sciences (AIIMS). It will be available at much cheaper price than the ones available at present.

"Amid the dearth of PPE such as Powered Air-Purifying Respirators (PARPs) and well-sealed face masks, it becomes essential to complement the use of makeshift acrylic face shields, N95 masks and surgical respirators, with a proper obstruction for aerosol spewed via the mouth and nose of the patient. The intubation box allows having this protection in place by limiting the infection within the box's volume around the patient," Umang Mathur, a B.Tech student at the Department of Bioscience, told PTI

"Unlike other PPE, this box works effectively for multiple doctors and nurses serving the patient. While the transparent material allows visual access to the head of the patient inside, the arm-holes on the box allow for the care-provider to perform any necessary tasks including intubation and extubation, which are both processes known to be cough inducing. Further, the boxes are reusable, as they may be cleaned thoroughly with 70 per cent alcohol or bleach, to allow use for the next patient," Umang added.

According to Sanchit Jhunjhunwala, a Mechanical Engineering student, based on the feedback received from AIIMS and other COVID-19 health centres, the design will be further optimised for improved efficacy, before the first batch is manufactured in Gurgaon (Haryana).

"We have started a crowd funding campaign in order to manufacture these boxes and provide them to government hospitals for free. The campaign raised a record INR 50,000 within six hours of launching," Sanchit said

"It is a low-cost alternative to intubation boxes and is easier to manufacture and deliver amid the lockdown. The projected cost per box is INR 2000, which is significantly lower than existing alternatives," he added.

The six-member team includes Prateek Manocha and Vrishank Bhardwaj, from department of electrical engineering; Shwetank Panwar from Department of Biosciences and Bioengineering and Vignesh Kumar from Department of Design.

The Government-run Industrial Training Institute (ITI) in Behrampur has also developed an aerosol box for intubation process.

*(Disclaimer: This story has not been edited by Outlook staff and is auto-generated from news agency feeds. Source: PTI)*

<https://www.outlookindia.com/newscroll/iti-students-develop-intubation-boxes-for-covid19-patients-with-breathing-problems/1816994>



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## Rajnath asks OFB, DPSUs to ramp up production

New Delhi: Defence Minister Rajnath Singh on Tuesday directed the defence public sector undertakings (DPSU) and Ordnance Factory Board (OFB) to be ready with contingency plans to ramp up production and contribute extensively to the economic recovery.

Taking stock of the overall preparedness of the PSUs to compensate for the lost working time due to lockdown, Singh referred to Prime Minister Narendra Modi's plans to revive the economy post-lockdown and said the defence production units along with private defence industry could play a major role in the economic revival. The minister conveyed this message during video-conference meeting with the PSUs and OFB.

“Several Units of OFB and DPSUs which are located in non-red zones have already started operations. Almost all DPSUs have made contingency plans to ramp up production after the lockdown is lifted by drawing up plans to work in three shifts and extending the work days from five to six days a week,” defence ministry officials said after the meeting. They also said work will be carried out in the defence factories by observing social distancing and other relevant health guidelines.

During the conference, OFB conveyed that it has manufactured 12,800 overalls, developed specialised machines for testing Personal Protection Equipment (PPE), supplied 6.35 lakh masks to local authorities and 340 specialised tents to Arunachal Pradesh for COVID 19 patients. The OFB is more than 100 years old and has 41 factories across the country manufacturing missiles, tanks, guns, ammunition and other weapons for the armed forces.

The Bharat Electronics Ltd (BEL) has made arrangements to manufacture 12,000 ventilators in the month of May 2020 and another 18,000 in June 2020, the defence ministry statement said adding, around 3,000 engineers will also participate in training health professionals in operationalising these ventilators.

The Department of Defence Production (DDP), defence ministry, OFB and DPSUs made a contribution of ₹77 crore to the PM CARES fund generated from Corporate Social Responsibility (CSR) funds and one day salary contribution, the statement said.

Separately, the Defence Research and Development Services (DRDS), the main cadre of Defence Research and Development Organisation (DRDO) to which about 7,000 scientists belong, made a contribution of ₹10 lakh to PM CARES fund in addition to one day salary. The demand draft of ₹10 lakhs was handed over to Minister of State for Defence Shripad Naik by All India DRDS Association (AIDA) last week.

During the conference, the OFB also reported that there was no COVID 19 positive case in any of its 41 manufacturing locations. Moreover, in its fight against the coronavirus pandemic, the OFB distributed one lakh litres of hand sanitizer and earmarked 280 isolation beds at its hospitals in 10 locations.

The aviation conglomerate Hindustan Aeronautics Limited (HAL) has also earmarked 93 isolation beds in Bengaluru for COVID-19 patients. The HAL has manufactured 300 aerosol cabinets and supplied them to various hospitals. It has also distributed 56,000 masks and extended support to migrant labour.

The Bharat Dynamics Ltd (BDL) is also working with eminent scientists for finalisation of design for ventilators and to make the prototype. The

Mazagon Dock Shipbuilders Limited (MDL) provided PPE and medicines worth Rs Five lakh to Naval Quarantine Centre, Mumbai and distributed 4,000 litres of sanitiser.

Secretary, (Department of Defence Production) Raj Kumar, senior officials of Department of Defence Production, senior officials of OFB, BEL, HAL, MDL, Bharat Earth Movers Ltd (BEML), Garden Reach Shipbuilders & Engineers Ltd (GRSE), BDL, Hindustan Shipyard Ltd. (HSL), Midhani Mishradhatu Nigam Ltd (MIDHANI) and Goa Shipyard Ltd participated in the video conference.

<https://www.dailypioneer.com/2020/india/rajnath-asks-ofb--dpsus-to-ramp-up-production.html>



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## TEDBF v/s. N-AMCA: Future of Indian Navy

The Aeronautical Development Agency (ADA) controlled by the Defence Research & Development Organization (DRDO) will develop a Twin Engine Deck Based Fighter (TEDBF) for the Indian Navy (IN) instead of persisting with the development of a Mk2 variant of the LCA-Navy (NLCA) design.

The DRDO offered to develop a new twin-engine deck-based fighter aircraft for the Navy based on the experience of the Naval Light Combat Aircraft (LCA) and it should be ready by 2026, Navy Chief Admiral Karambir Singh said on 03 December 2019. He also noted that the Navy expected to have the first Indigenous Aircraft Carrier (IAC-1) Vikrant operational by 2022. "The Qualitative Requirements [QR] are being made.



They said they should be able to push it out by 2026. If it meets our time and QR requirements, we will definitely take it [fighter aircraft]," he said at the customary annual press conference ahead of the Navy Day.

The advantages of a twin-engine design are many, first, it will have increased speed and maneuverability, the jet will have enhanced range because it can carry more fuel and with refueling, it can be extended to well over 2000 km. It can carry larger combat loads. It is also less susceptible to mechanical failures or combat damage.

It can carry larger combat loads. At high altitudes, using two engines will have tremendous supplemental benefits, as losing a single engine jet over water or land is a much more life-threatening experience. System redundancy is a tertiary benefit of multi-engine aircraft, since losing engine results in only a 50% loss in total available thrust, plus redundant generators and hydraulic pumps will allow the aircraft to fly. In addition, having two engines will reduce training losses.

TEDBF/ORCA will borrow most of the cockpit technologies like Next Generation Wide Area Display (WAD) and side-stick controls from the MWF program and will also have the same high powered Digital flight control computer (DFCC) along with the same set of UTTAM AESA Fire Control Radar mated to bolt-on Infrared Search and Track (IRST) system for optically hunting down enemy aircraft, especially stealthy ones from the MWF program.

The new TEDBF fighter will be powered by two GE F-414 engines and the aircraft will have an all-up weight (AUW) of 24 tonnes. The aircraft will reportedly have a payload capacity of 9 tonnes and a maximum speed of approximately Mach 1.6. The aircraft would be comparable in size with the MiG-29K fighter jet currently operated by the Indian Navy from INS Vikramaditya.

### Naval AMCA

LCA-Navy Mk1 seems to be a learning experience that both ADA and Navy relied on to avoid repeating the same mistakes. It is also recorded fact that airforce to navy conversion is much harder than the vice versa. Su-33 and Mig-29K which were developed from their Air force version still have a long list of issues that simply can't be fixed and even F-35C stealth fighter developed by the

united states for its Navy has many technical issues that limit its performance against F-35A which is its air force version.

Naval-AMCA will also need to make space for structural reinforcements and have the ability to carry additional fuel and not to forget reinforced landing gears, tail hooks, and larger wings to for increased low-speed control for carrier landings.

Naval-AMCA will also weigh more due to the strengthening of the air frame which might result in additional thrust requirements required by the Naval-AMCA to make carrier takeoffs with reasonable weapons load and fuel.

<https://www.defenceaviationpost.com/2020/04/te dbf-v-s-n-amca-future-of-indian-navy/>

