

## डीआरडीई ने तैयार किया N-99 मास्क: इसकी एडवांस तकनीक करेगी संक्रमण से बचाव

*अतुल सक्सेना*

देश की चुनिंदा बायोसेफ्टी(biosafety) लैब(lab) में से एक ग्वालियर(gwalior) की DRDE ने अपनी तकनीक(technology) से एडवांस टेक्नोलॉजी(advance technology) वाला N -99 मास्क(mask) तैयार किया है। इसका निर्माण मुंबई(mumbai) और कोलकाता(kolkata) की दो कंपनियां(companies) कर रहीं हैं और इसके निर्माण में लगने वाला विशेष कपड़ा गुजरात(gujrat) की एक कंपनी तैयार कर रही है।



रक्षा मंत्रालय के रक्षा अनुसंधान एवं विकास संस्थान (DRDO) की ग्वालियर स्थित लैब रक्षा अनुसंधान एवं विकास स्थापना(DRDE) ने एक बार देश के हित में योगदान दिया है। कैमिकल(chemical) और बायोलॉजिकल(biological) हथियारों के खिलाफ लड़ने के लिए तकनीक विकसित करती है। जिसका उपयोग देश की सुरक्षा और खुफिया एजेंसियां करती हैं। देश में हुए कोरोना अटैक(corona attack) के बाद N-95 मास्क की आवश्यकता बढ़ गई। जिसके बाद भारत ने इसका निर्यात रोक दिया बावजूद इसके बढ़ते कोरोना संक्रमण से बचाव के लिए डॉक्टर्स और पैरामेडिकल स्टाफ सहित देश के नागरिकों के लिए मास्क की आवश्यकता पड़ रही थी। विशेषज्ञों ने सलाह दी कि केवल संक्रमित व्यक्ति और उसके संपर्क वाला व्यक्ति के लिए N-95 मास्क आवश्यक है शेष व्यक्ति कोई भी अन्य मास्क या कपड़ा लगा सकता है।

इस बीच रक्षा मंत्रालय का DRDO मास्क पर लगातार रिसर्च कर रहा था। DRDO की ग्वालियर स्थित लैब DRDE ने अलग अलग राज्यों से आये विभिन्न कंपनियों के 73 मास्क की रिपोर्ट बनाकर मंत्रालय भेज दी लेकिन किसी की फिल्ट्रेशन क्षमता 50 प्रतिशत थी तो किसी की 80 प्रतिशत। ये क्षमता मास्क में प्रयोग किये गए फेब्रिक और मटेरियल के आधार पर जांची गई। इस बीच DRDE के वैज्ञानिकों ने अपनी तकनीक विकसित की और लगातार मेहनत के बाद एडवांस तकनीक वाला N-99 मास्क तैयार कर लिया। मास्क का परीक्षण कर लेने के बाद इसके निर्माण का रास्ता साफ हो गया। जानकारी के अनुसार रक्षा मंत्रालय की रिपोर्ट के बाद कपड़ा मंत्रालय मुंबई की वीनस और कोलकाता की इंटेक सेफ्टी कंपनी में इनका बल्क में निर्माण करा रहा है। खास बात ये है कि इस मास्क के लिए प्रयोग होने वाला विशेष कपड़ा गुजरात की अटीरा कंपनी में तैयार किया जा आ रहा है। विशेषज्ञ मानते हैं N-99 मास्क 99 प्रतिशत तक सुरक्षित है। इसको लगाने से डॉक्टर्स, पैरामेडिकल स्टाफ और कोरोना संक्रमित मरीज के सीधे संपर्क वाले लोग सुरक्षित रह सकेंगे। माना जा रहा है कि जल्दी ही ये मास्क राज्य सरकारों को उपलब्ध होगा और कोरोना वारियर्स इसका उपयोग कर सकेंगे।

<https://mpbreakingnews.in/breaking-news/drde-prepare-n-99-mask-its-advanced-technology-will-prevent-infection/>

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

*Technologies based on immunological detection, gene amplification being offered to private industry for development*

*By Vijay Mohan*

Chandigarh: 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.tribuneindia.com/news/nation/drdo-adapts-two-more-bio-warfare-technologies-to-fight-covid-19-77080>

ज्ञान प्रसार एवम् विस्तार  
के 50 वर्ष

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## Fight against Coronavirus: Critical LCA technology offered to the hospitals by DRDO

*Now, the MOP technology an offshoot of a critical system onboard Tejas utilizes Pressure Swing Adsorption (PSA) technique combined with molecular sieve technology to generate oxygen directly from atmospheric air*

*By Huma Siddiqui*

One of the spin-offs from a critical technology developed in India by the Defence Research and Development Organisation (DRDO) has now been offered to hospitals to fight COVID-19 — Medical Oxygen Plant (MOP) technology. Defence Bioengineering and Electro-medical Laboratory (DEBEL) a specialized lab of DRDO has developed onboard oxygen generation system (OBOGS) centric integrated life support system (ILSS) for indigenous Light Combat Aircraft

`Tejas'. This lab is more focused on the development of bio-medical and electro-medical soldier support systems.

Now, the MOP technology an offshoot of a critical system onboard Tejas utilizes Pressure Swing Adsorption (PSA) technique combined with molecular sieve technology to generate oxygen directly from atmospheric air.

This critical technology has got its safety certification agency CEMILAC and the oxygen generator components have been developed by DEBEL and technology has been transferred to a Coimbatore based firm.

According to Milind Kulshreshtha, C4I expert, "Establishing an ILSS technology in military aircraft is a niche area which DEBEL has been working on and the design of the system is planned to be versatile enough to be adaptable to fit on other fighter jets being flown by Indian Air Force (IAF)."

### **Why the Specialized Oxygen System onboard `Tejas`**

"The mid-air refuelling of aircraft requires enhanced pilot endurance too thus, a need to facilitate breathable oxygen for the pilot in the cockpit. Conventional systems like Liquid Oxygen (LOX) systems need to be replaced with an onboard generation of Oxygen. The OBOGS forms part of ILSS (Integrated Life Support System) for Tejas," explains Kulshreshtha.

### **How does it work?**

"The system is compactly designed to get integrated within the confined space on an aircraft and replaces Liquid Oxygen based system (LOX), which is based on liquid oxygen supply on board. The oxygen concentration in the breathing gas is detected using a solid-state oxygen sensor along with other sub-systems and supporting back-up mechanism. The integrated ILSS-OBOGS system forms part of a pilot's life support during emergency escape is," says Kulshreshtha.

According to DRDO, the OBOGS utilizes the bleed air from the aircraft engine by separating oxygen by a specialized process and oxygen of required aviation-grade purity is generated as long as the engine is operational.

### **Where is this technology being used currently?**

An Oxygen plant has been installed on some of the army sites on North East and Leh-Ladakh Region by the DRDO and has been operational since 2017. And the plant complies with international standards like ISO 1008, European, US and Indian Pharmacopeia.

### **Role in fighting coronavirus?**

This plant can be very useful in the hospitals located in urban and rural areas and will help in avoiding dependency on oxygen cylinders. Also, this will be more useful in remote and high altitude areas, as they are easy to transport, are low cost and will provide oxygen round the clock.

<https://www.financialexpress.com/defence/fight-against-coronavirus-critical-lca-technology-offered-to-the-hospitals-by-drdo/1941277/>



This lab is more focused on the development of bio-medical and electro-medical soldier support systems.



## **India needs robust bio-defence strategies against terror or natural outbreaks, say experts**

*By Rajat Pandit*

New Delhi: The jury is still out on the exact origin of Covid-19, even though both China and WHO contend it was not lab-made at Wuhan. But the pandemic has underscored like never before the need for India to be prepared for deadly bio-threats, whether they arise from natural outbreaks or bioterrorism.

Defence scientists and experts, in fact, warn that though the possibility of overt bio-warfare by a state is remote, the danger of non-state actors getting hold of virulent biological agents and unleashing them for “low-cost, high-impact strikes” in the country should not be discounted.

“India needs to prepare a comprehensive blueprint, with detailed action plans and strategies, on bio-threat preparedness, response, mitigation and restoration,” said Dr W Selvamurthy, a former chief controller in DRDO who led the CBRN (chemical, biological radiological and nuclear) defence programme.

A defence scientist, who did not want to be named, in turn, said the use of “biological or germ weapons” in the shape of bacteria, viruses, fungi or other toxic agents remains a clear and present threat.

“Terrorists can get hold of germ weapons, which can cause anthrax, plague, smallpox, botulism, Ebola, SARS and the like, from microbiological labs and other facilities. They will be like silent bombs nobody can detect. Biological weapons, in fact, are far more easier to obtain or develop than ‘dirty’ nuclear bombs,” he said.

India needs to prepare for bio-threats, whether accidental or planned, at both the military and civilian levels because they can be highly contagious and spread widely to disrupt national security and public health.

“A national mission mode program on mitigation of bio-threats should be launched, with an inter-ministerial steering committee and overall coordination under the national security advisor, because they can impact the nation’s comprehensive national security,” Dr Selvamurthy told TOI.

Noting that India has only one advanced Bio-Safety Level-4 (BSL-4) facility at the National Institute of Virology in Pune, he said at least five more such labs in different parts of the country for advanced R&D on the pathogens and genomic profiling were needed.

“We must have a central database of pathogens. There should be robust surveillance mechanisms, which would include development of nanotechnology-based bio-radars with sensor arrays for pathogens. All this should be backed by comprehensive containment, decontamination and restoration strategies,” added Dr Selvamurthy.

The country also needs properly-trained and well-equipped quick-reaction teams to handle virulent pathogens, as also other CBRN contingencies, stationed at different regional centres in the country.

While DRDO has developed a wide array of CBRN defence equipment for the armed forces over the years, ranging from nerve agent detectors, dosimeters and decontamination kits to integrated field shelters, respiratory masks and suits, it needs to focus on futuristic technologies for early detection and mitigation of such threats. “The urgent need to have strong bio-defence capabilities has been brought home by Covid-19,” said a Scientist.

<https://timesofindia.indiatimes.com/india/india-needs-robust-bio-defence-strategies-against-terror-or-natural-outbreaks-say-experts/articleshow/75399856.cms>

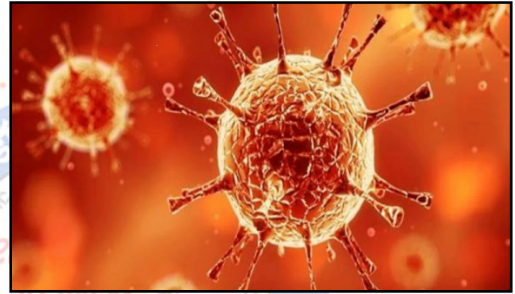


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### COVID-19: भारत में तैयार हुआ कोरोना का अभेद्य कवच, DRDO ने भी किया टेस्ट में पास

*ये कोरोना वायरस महामारी से लड़ने में सहायक साबित होगा।*

नई दिल्ली: अंबाला के एक स्टार्टअप ने सोमवार को कहा कि उसने एक बिना बुना हुआ कपड़ा तैयार किया है, जो शरीर को ढंकने वाली पेशाक बनाने में उपयोगी है। इस कपड़े की मदद से चिकित्सा कर्मचारियों के संक्रमित होने का जोखिम बहुत कम हो जाएगा और ये कोरोना वायरस (Coronavirus) महामारी से लड़ने में सहायक साबित होगा।



इस कपड़े का विकास करने वाले एनयूएफएबी टेक्निकल टेक्सटाइल्स ने दावा किया है कि यह उत्पाद पूरी तरह अभेद्य है, और इससे अग्रणी मोर्चे पर काम कर रहे चिकित्साकर्मियों को संक्रमण के जोखिम को 90 प्रतिशत तक कम करने में मदद मिलेगी। कंपनी ने कहा कि इन मूल्यवर्धित कपड़ों को डीआरडीओ ने प्रमाणित किया है और ये शरीर को ढंकने वाली पेशाक बनाने में बहुत अधिक उपयोगी है। एनयूएफएबी के निदेशक सलिल गोयल ने कहा कि हमारी नई पेशाक एक विशेष उत्पाद है और ये डीआरडीओ से प्रमाणित है। ये संक्रमण की आशंका को काफी हद तक कम कर देता है।

बताते चलें कि कोरोना महामारी से बचाव के लिए सरकार ने कई तरीकों को अपना रखा है। इसमें पीपीई किट, मास्क, हैंड सैनिटाइजर इत्यादि शामिल हैं जिसका इस्तेमाल देशभर में कोरोना वॉरियर्स के साथ-साथ हर नागरिक भी कर है। इसके अलावा स्वास्थ्य मंत्रालय ने भी हेल्थ गाइडलाइन जारी की है जिसका इस्तेमाल आज पूरा देश कर रहा है।

<https://zeenews.india.com/hindi/india/covid-19-ambalas-startup-creates-infection-reducing-fabric-drdo-approved-in-test/673443>



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### Ambala-based startup develops fabric to reduce infection risk among medical workers

New Delhi: An Ambala-based startup on Monday said it has developed a non-woven fabric useful in making coveralls which significantly reduces the risk of infection to medical workers and can be helpful in the fight against the coronavirus-related pandemic.

NUFAB Technical Textiles, which has developed the fabric, claims the product is impregnable, permeable and above all breathable, which will help frontline medical workers immensely by reducing the infection risk up to 90 per cent.

The value-added fabric is certified and approved by the DRDO and is extremely useful in making coveralls gowns - personal protection equipment used by health warriors, the company stated.

NUFAB Director Salil Goyal said, "Our new offering is a specialised product and is certified from the DRDO. Besides being light weight, the fabric is breathable and thus, reduces chances of infection substantially."

"The other benefit is that it is recyclable and eco-friendly," he added.

*(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/ambalabased-startup-develops-fabric-to-reduce-infection-risk-among-medical-workers/1816239>

## DRDO Technology



Tue, 28 April 2020

# 8 Years of Agni-V and way forward for India

*By Tushkar Shirodkar*

In 2012, in April 8 years ago, India had shocked the world by testing Agni-V and entering into elite ICBM Club with its range of over 5500km bringing all of China and much more within its strike envelope. Test placed India with a 5-member ICBM club which consists then of USA, Russia, China, France, and the UK.

Ability to strike targets in most of the Asia and European nations meant that many countries were nervous of the India newfound capabilities but harsh or severe critical criticism of the test never came from the western and European countries and even Chinese officials downplayed testing of Agni-V and called India a "Partner" in the region.

But no hold attack came from the Chinese media which not only slammed India but also called it "missile delusion" and Chinese mouthpiece like "Global Times" warned India against attempting "containment" of China with testing of the new missile. Chinese missile scientist and defense commentator called Agni-V range being fudged and said the missile has a range of at least 8000 km and not 5500 km as showcased to avoid western criticism by India.

Agni-V soon became the attention of the masses and was also showcased at the military parade but soon India realized that the missile is drawing unwanted attention from the friendly nations. first, it disappeared from the military parades, and then little or new pictures of the missile system was available and now severally limited to the public domain.

Since 2012, Agni-V has been tested Seven Times and Five times in canisterised version of the missile improving its road-mobility and also making it harder to be detected from the space. Indian media reports indicate that the missile system finally has entered limited scale production and is being deployed by Strategic Forces Command which is in charge to use them.

Since 2012, India has not announced any new land-based long-range missile program nor any successor to the Agni-V program leading to speculation that India might have decided to curb its long-range land-based missile program in favor of secretive long-range submarine-launched missiles to avoid upsetting many friendly nations in the neighborhood.

Agni-V if launched from the southern tip of India still will be able to strike Beijing and other major cities of China with a lighter payload and the need for longer-range land-based missiles also has been diminishing due to fear of them being attacked at launchpads or located while on road from satellites.

Since the first launch of Agni-V program, India has initiated K-5 SLBM program for its Nuclear Triad which will be equivalent to the Agni-V in terms of the range of 5000+ km and will be India's first ICBM for its underwater nuclear submarine force and according to media reports DRDO has been given clearance to also start work on the K-6 SLBM which will be India's first SLBM with Multiple independently targetable reentry vehicle (MIRVs) capabilities.

There has been unverified news also that the DRDO is also been tasked to enhance Agni-V range and capabilities without actually developing a successor program to the Agni-V to avoid heat from friendly nations. DRDO has been testing new propellant for the third stage section of the Agni-V program which could be to increase the range of the missile system and also to sustain better burn rate in flight. Agni V-A which is reported to be a derivative of the Agni-V is expected to feature multiple independently targetable reentry vehicle (MIRVs) capabilities with improved range.

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<https://idrw.org/8-years-of-agni-v-and-way-forward-for-india/#more-226032>

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