

## Low cost, high volume products being developed; DRDO Chief says Scientists rising to the occasion

*From adhesives used in submarines to special coating originally designed for high strength parachutes, India has been using spin offs from its available defence technology*

*By Manu Pubby*

New Delhi: From adhesives used in submarines to special coating originally designed for high strength parachutes, India has been using spin offs from its available defence technology to quickly develop low cost, high volume equipment desperately needed in the fight against Covid-19.

More than half a dozen essential items—ranging from high protection face masks to full body protection suits and multi patient ventilators—have been churned out at high speed over the past week as the Defence Research and Development Organisation (DRDO) has reoriented itself towards fighting the prevalent threat.

‘Missile man’ G Sateesh Reddy, who Heads DRDO, said Scientists throughout the country have been tasked with developing and sharing technologies at zero cost with the private sector to mass produce critical items identified by the government, with solutions being provided overnight and personnel working overtime to tackle stumbling blocks.

Reddy, who is also a member of the empowered working group tasked with ensuring adequate supply of medical equipment, shared with ET that more products are likely to be rolled out in the coming days in partnership with the industry as new needs arise.

“The scientific fraternity has felt the need of the hour and wants to use existing skills to create spin off technologies. We are coming out with quick solutions and products. Scientists have been working day and night to rise to the occasion,” Reddy told ET.

Even as DRDO—best known for its self-developed line of nuclear capable missiles that have given India its strategic deterrence—continues its regular work of design, analyses and review of weapon systems, several scientists and labs have been tasked to help civilian authorities on a war footing.

<https://economictimes.indiatimes.com/news/defence/local-defence-technology-helps-fight-covid-19/articleshow/74958610.cms>



## Business Standard

### DRDO provides masks, PPE to RML, AIIMS

The Defence Research and Development Organisation (DRDO) on Friday handed over 1,500 N-95 masks, 70 PPE kits and hand sanitisers to doctors and nurses at AIIMS and RML Hospital here to fight the COVID-19 pandemic.

"As the production is less, we have given a token of 1,000 masks, 20 PPE to RML Hospital and 500 masks, 50 PPE to AIIMS. We have also handed over the hand sanitisers to doctors and nurses for their personal use," Sanjeev Joshi, Technical Advisor to DRDO chairman, told ANI.

He said the DRDO has been keeping an eye on the situation since the first case was confirmed in India and the chairman has also been viewing the issue with a different perspective and how can it be contained.

"We had started making hand sanitisers in our lab in Gwalior during the end of February when critical cases started coming out in India," he said.

He further said that as the demand was more and supply was not enough, we asked all of our labs in Delhi, Puna, Hyderabad, and other places to formulate the sanitisers as per the WHO guidelines.

"As the demand for N-95 masks was there, we started testing these masks whether they are good at fighting coronavirus or not. We have also developed an N-99 mask, which is better in quality," he said.

*(This story has not been edited by Business Standard staff and is auto-generated from a syndicated feed.)*

[https://www.business-standard.com/article/news-ani/drdo-provides-masks-ppe-to-rml-aiims-120040301619\\_1.html](https://www.business-standard.com/article/news-ani/drdo-provides-masks-ppe-to-rml-aiims-120040301619_1.html)



*Sat, 04 April 2020*

## **DRDO develops portable backpack for sanitisation equipment**

New Delhi: In a quest for developing indigenous solutions to combat the coronavirus Pandemic, Defence Research and Development Organisation (DRDO) has developed portable backpack for area sanitisation equipment.

"The Centre for Fire Explosive and Environment Safety (CFEES), Delhi, has developed two configurations of sanitising equipment. These are spinoffs from technologies developed for fire suppression application," DRDO said in a statement.

The CFEES, Delhi, with the help of its industry partner has developed portable sanitisation equipment for spraying decontamination solution consisting of one per cent Hypochlorite (HYPO) solution for sanitisation of suspected area.

The portable system can be mounted as a backpack and can be carried by the operations personnel.

This system incorporates low pressure twin fluid, air and disinfectant liquid, technology to generate very fine mist.

The system is capable of disinfecting upto 300 square metre area. The application areas can include hospital reception, doctor chambers, office spaces dealing with general public, corridors, pathways, metro and railway stations and bus stations, etc.

The Centre with the help of its industry partner has also developed a higher capacity which is carried on a trolley.

The system incorporates low pressure single fluid, disinfectant liquid, technology generating very fine mist.

It is capable of disinfecting upto 3,000 square metre area.

"It has a tank capacity of 50 litres and has a lancing (throw) distance of 12-15 metres. This is useful for disinfecting hospitals, malls, airports, metro stations, isolation areas, quarantine centres and high risk residential areas," the DRDO states.

Two of these systems are being provided to Delhi Police for immediate use. These can be made available to other agencies with the help of industry partners.

<http://www.daijiworld.com/news/newsDisplay.aspx?newsID=692340>

## DRDO's food lab readying RTE meals, 'just in case'

*Rice, chapatis, curry, sweet and tea is on the menu; it will*

*By Hemanth CS*

Though at present there is no large- scale shortage of food across the country even as the Covid-19 crisis rages on, laboratories involved in food research are gearing up to ensure that ready-to-eat food is available, if a worst case scenario occurs and there is a shortage.

Mysuru- based DRDO constituent lab, Defence Food Research Laboratory (DFRL) which has been developing packaged rations for the armed forces for many decades, is ensuring that its Meals Ready to Eat (MREs) would be available if there is a shortage of fresh food.

“DRDO has been traditionally supplying food for the armed forces. The MREs are consumed by the armed forces personnel when freshly cooked food cannot be supplied in remote or far-flung areas where they are deployed. Similarly, we are working to ensure that there is supply of these MREs, if fresh food is not available due to the ongoing Covid-19 crisis,” AK Singh, director general (life sciences), DRDO told Bangalore Mirror.



*Some of the MREs produced by DFRL*

Supply of hygienic food is important in the present crisis, the ready-to-eat food developed by us adheres to this aspect. Our MREs can be served to people employed in health care and essential services sector – AK Singh, DG (life sciences), DRDO.

Singh said that the MREs can be supplied to those who are employed in the health care and essential services sector. “Supply of hygienic food is important in the present crisis, the ready to eat food developed by us adheres to this aspect. Our MREs are easy to transport and can be served to people who are employed in the health care and essential services sector,” he said.

Typically, one MRE consists of rice, chapatis, vegetarian/non-vegetarian curry, sweet, tea etc. Singh said that the ready to eat food would focus on energy and palatability.

“The ready to eat food apart from having a high source of energy should also be palatable. We will ensure that they contain all the necessary protein and carbohydrates and at the same time are tasty,” he added.

Apart from the food items listed above, DRFL also prepares energy bars, cookies, instant mixes and beverages.

<https://bangaloremirror.indiatimes.com/bangalore/others/drdo-food-lab-readying-rte-meals-just-in-case/articleshow/74975746.cms>

## डीआरडीओ हर रोज 15 हजार एन 99 मास्क बना रहा है

नई दिल्ली: सरकार ने कोरोना के इलाज में जुटे डॉक्टरों, नर्सों और पैरामेडिकल स्टाफ के लिए 1.10 करोड़ एन95 मास्क और 1.60 करोड़ लाख पर्सनल प्रोटेक्शन इक्विपमेंट (पीपीई) का ऑर्डर दिया है।

डीआरडीओ ने भी हर दिन 15 हजार एन 99 मास्क बनाना शुरू किया है। दो भारतीय कंपनियां भी हर दिन एक लाख एन95 मास्क बनाने में लगी हैं। स्वास्थ्य मंत्रालय एक वरिष्ठ अधिकारी ने यह जानकारी दी। उन्होंने बताया कि अब तक राज्य और केंद्र सरकार के अस्पतालों को 3.5 लाख पीपीई दिया जा चुका है।

15 अप्रैल तक 10 लाख और पीपीई की सप्लाई केंद्र सरकार को मिलेगी। अस्पतालों को केंद्र ने 12.5 लाख एन95 मास्क दिए हैं। जबकि 14 लाख मास्क स्टॉक में है। ये मांग के अनुसार अस्पतालों और राज्यों को दिए जाएंगे। 5 अप्रैल तक 7 लाख एन95 मास्क मिलेंगे। देश में 22 लाख डॉक्टर और नर्स हैं।

<https://www.bhaskar.com/news/drdo-is-making-15-thousand-n99-masks-everyday-073032-6969157.html>

## नवभारत टाइम्स

### कोरोना वायरस: डीआरडीओ ने विकसित की सैनेटाइज करने की तकनीक

नई दिल्ली तीन अप्रैल (भाषा): कोरोना वायरस से लड़ने की भारत की क्षमता को बढ़ाते हुए रक्षा अनुसंधान एवं विकास संगठन (डीआरडीओ) ने विभिन्न क्षेत्रों को सैनेटाइज करने की तकनीक विकसित की है। अधिकारियों ने शुक्रवार को यह जानकारी दी। इससे पहले डीआरडीओ ने सेफ्टी सूट, वेंटिलेटर और विशेष प्रकार के मास्क का निर्माण करने में सफलता अर्जित की थी। डीआरडीओ ने एक वक्तव्य में कहा कि दिल्ली स्थित विस्फोटक एवं पर्यावरण सुरक्षा केंद्र (सीएफईईएस) ने सैनेटाइजिंग उपकरण के दो प्रकार विकसित किए हैं। आग बुझाने की तकनीकों के विकास पर काम करने के दौरान यह तकनीक विकसित हुई।

सैनेटाइजिंग उपकरण के दो प्रकार विकसित किए गए हैं- एक पीठ पर लेकर चला जा सकता है और दूसरे उपकरण को ट्रॉली का आकार दिया गया है। पीठ पर ले जा सकने वाले उपकरण को सैनेटाइज करने वाले कर्मों कहीं भी ले जा सकते हैं और इससे 300 वर्ग किलोमीटर के क्षेत्र को संक्रमण मुक्त किया जा सकता है।

इसके इस्तेमाल से अस्पताल, डॉक्टर के कक्ष, कार्यालय, गलियारे, मेट्रो, रेलवे स्टेशनों इत्यादि पर छिड़काव किया जा सकता है। डीआरडीओ ने कहा कि ट्रॉली के आकार वाले उपकरण की सहायता से 3000 वर्ग किलोमीटर के क्षेत्र को संक्रमण मुक्त किया जा सकता है। वक्तव्य में कहा गया कि इन उपकरणों को

तत्काल प्रयोग में लाने के लिए दिल्ली पुलिस को उपलब्ध कराया जा रहा है। जल्दी ही निजी क्षेत्र के सहयोग से इन्हें अन्य एजेंसियों को भी मुहैया कराया जाएगा।

(यह आर्टिकल एजेंसी फीड से ऑटो-अपलोड हुआ है। इसे नवभारतटाइम्स.कॉम की टीम ने एडिट नहीं किया है।)

<https://navbharattimes.indiatimes.com/india/corona-virus-drdo-has-developed-the-technique-of-sanitization/articleshow/74973765.cms>

## THE ECONOMIC TIMES

Sat, 04 April 2020

# Building up defences: DRDO uses available technology to fight Covid

### Covid-19 outbreak: DRDO on a war-footing

As India prepares to fight the Coronavirus pandemic, DRDO has emerged as a critical force-multiplier in combating the virus. It has used its years of experience and available technology to develop essential items for frontline mitigation.

From N99 masks to multi-patient ventilators, DRDO has quietly taken upon itself to develop a range of leading products on a war-footing.

### Hand Sanitizer

Hand sanitizer being the basic instrument against spread of COVID-19 that has now been developed in-house at DRDO. By 3rd week of March, it was produced in sizable quantities and distributed to major offices and establishments within the capital. Approximately 4,000 litres of hand sanitizer has been provided to Indian Armed forces, Armed Forces Medical Corps, Defence Security Corps, 1,500 litres to Ministry of Defence, 300 litres to Parliament, and 500 litres to various security establishments and high offices to address sanitization issue at first to keep administration work without fear of contamination.

### Ventilators

Since COVID-19 affects pulmonary functions, keeping in mind the futuristic requirement, the Society for Biomedical Technology (SBMT) programme of DRDO has been modified to cater to the current situation. It has been created by using existing technologies like breath regulators, pressure/flow sensors, etc. Presently, innovation is on to create 'Multi patient ventilator' wherein several patients can be supported by a single ventilator. This innovation is expected to be available within a week. Around 5,000 ventilators will be produced in the first month and 10,000 subsequently. The DRDO has identified local alternatives to supply of critical components. Already Secretary (Pharmaceuticals) has identified nine companies for design transfer to produce and Mr Anand Mahindra for fabrication of components. Each ventilator unit will cost around Rs four lakh.

### N99 Masks

Five layer N99 masks with two layers of nano mesh are very advanced. The mask costs Rs 70 per piece.

### Bodysuits

Body suit is a critical requirement for doctors, medical staff, sanitation workers, etc so that they are not contracted by COVID-19 during their work. Earlier, DRDO had developed this body suit for medical & paramedical staff to manage & evacuate the casualties in the event of radiological emergencies, which right now is converted as a full body suit to stop contamination. Each suit costs Rs 7,000.

<https://economictimes.indiatimes.com/news/defence/building-up-defences-drdo-uses-available-technology-to-fight-covid/ventilators/slideshow/74965029.cms>



## **DRDO develops bio-suits based on sealants used in submarine applications**

*By Hemani Seth*

Mumbai: The Defence Research and Development Organisation has manufactured a bio-suit for medical professionals to combat Covid-19 using a special sealant based on the sealant used in submarine applications according to media reports

The sealant can be used as an alternative to seam sealing tape according to the DRDO, *The Hindu* reported.

The bio suits used presently are prepared using the special glue for seam sealing by an industry partner and has cleared the test at Southern India Textile Research Association (SITRA) Coimbatore, it said.

According to DRDO, this could be a game-changer that can help with the shortage of bio suits hindered due to unavailability of seam sealing tapes. Currently, it can produce up to 7,000 suits a day with its industry partner. The DRDO is in process of roping in another partner to ramp up the production of suits up to 15,000 a day, as per the report.

Currently, there is a major shortage of personal protective equipment (PPE) for frontline workers, especially medical professionals in the country.

According to a recent report by *Reuters*, healthcare workers in India are resorting to using raincoats and helmets as protective gears owing to shortages of protective health gear amid the coronavirus pandemic.

For instance, junior doctors at a major coronavirus treatment facility in Kolkata were given plastic raincoats last week to examine patients.

The Union Health Ministry on Monday had said that they would be importing personal protective equipment (PPE) in bulk from countries including China, Singapore and South Korea apart from manufacturing it domestically as well.

Furthermore, the World Bank on Friday also announced \$1 billion funds in support of India's Covid-19 emergency response and health systems preparedness project which will include maximizing the supply of PPEs for professionals.

<https://www.thehindubusinessline.com/news/science/drdo-develops-bio-suits-based-on-sealants-used-in-submarine-applications/article31246509.ece>

## **Coronavirus update: DRDO develops bio-suit to protect doctors form COVID-19**

*To ensure these front line workers have a strong line of defence against the contagious virus, Defence Research and Development Organisation (DRDO) has developed a bio-suit to keep them safe*

*By Sonal Khetarpal*

New Delhi: As doctors, paramedic staff, nurse and other healthcare workers work relentlessly to cure patients of the COVID-19 pandemic that has gripped the world, they put their own life at risk.

To ensure these front line workers have a strong line of defence against the contagious virus, Defence Research and Development Organisation (DRDO) has developed a bio-suit to keep them safe.

Scientists at various DRDO laboratories have applied their technical know-how and expertise in textile, coating and nanotechnology to develop the Personal Protective Equipment (PPE) having a specific type of fabric with coating.

The suit has been prepared with the help of the industry and subjected to testing for textile parameters as well as protection against synthetic blood (a substitute that can fulfil some functions of the body's blood). The protection against synthetic blood exceeds the criteria defined for body suits by Ministry of Health and Family Welfare (MoHFW).

DRDO has partners the firm Kusumgarh Industries to produce the raw material and coating material. Another vendor is being brought in with the experience in garment technology and efforts are on to ramp up the capacity to 15,000 suits per day.

The current production capacity is 7,000 suits per day.

However, the statement by DRDO says, the bio-suit production is being hampered due to non-availability of seam sealing tapes. But, it is not a deterrent. DRDO has prepared a sealant drawing inspiration from sealant used in submarine applications as an alternative.

Presently, bio suits prepared using this glue for seam sealing by an industry partner has cleared test at Southern India Textile Research Association (SITRA) Coimbatore. This can be a game-changer for the textile industry. The DRDO can mass produce this glue through the industry to support the seam sealing activity by suit manufacturers.

<https://www.businesstoday.in/current/corporate/coronavirus-update-drdo-develops-bio-suit-to-protect-doctors/story/400118.html>