



NATIONAL RESEARCH DEVELOPMENT CORPORATION

TECHNOLOGY OFFER- NavRakshak

INTRODUCTION

COVID 19 Pandemic has posed unprecedented challenges at the global level. The Healthcare professionals are leading this war against the pandemic and they need to be safeguarded from acute risk of infection, while providing care to the victims. The Personal Protective Equipment (PPE) is the most essential defensive tool for protection of the Corona Warriors. However, availability of reliable, cost effective and comfortable PPEs is a huge challenge. The Indian Council of Medical Research and Ministry of Health & Family Welfare have promulgated benchmarks standards for PPE, based on international standards promulgated by WHO. While many PPEs compliant to the standards are available in the local market, however their cost effectiveness and suitability for the hot and humid weather conditions prevalent in India remain sub-optimal. To overcome these challenges, a Naval Medical Specialist of Innovation Cell, Institute of Naval Medicine Mumbai has developed a high quality PPE which provides full protection as per promulgated standards, is made of 'breathable' fabric, gives comfort to the wearer enhancing the user comfort even under prolonged use in hot and humid conditions and is extremely economical. This innovative solution developed by a young Doctor of Indian Navy is being steered for licensed production and IP management by the Intellectual Property Facilitation Cell (IPFC) of MoD in association with NRDC.

NavRakshak - A RESOURCE IMPROVED OPTIMISATION OF PERSONAL PROTECTIVE EQUIPMENT

Titled as NavRakshak, the technical know-how offers a suite of products including head gear, NavRakshak face mask and NavRakshak Cover-all and Shoe Covers. The Fabric material used is non-woven SSMMS (Spunbound-Spunbound Meltbound-Meltbound-Spunbound) of 51 GSM density and available in two variants (single-ply or two-ply for

different exposure situations including intense aerosol generating surgical procedures having higher viral loads). This technical know-how on offer aims to meet the shortfall in the availability of standard quality PPE in the country.

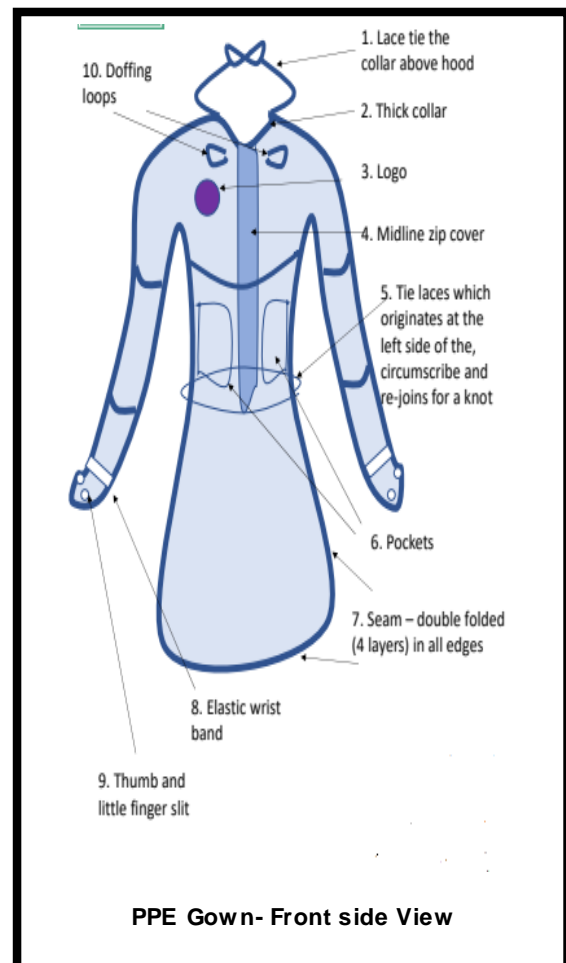


Fig. 1: NavRakshak PPE Suite (Protective Coverall 1 ply or 2 ply, SSMMS 51 GSM material/ fabric, 360 degree wrapping with securing strap at the lower ends of upper extremity sleeves and strap at the back for giving a tight fitting)

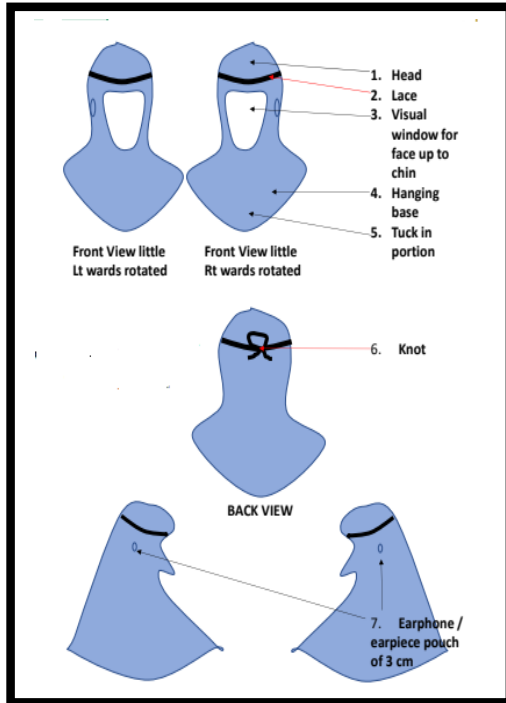


Fig. 2 Headgear/Hood Made of 01 Ply SSMMS 51 GSM

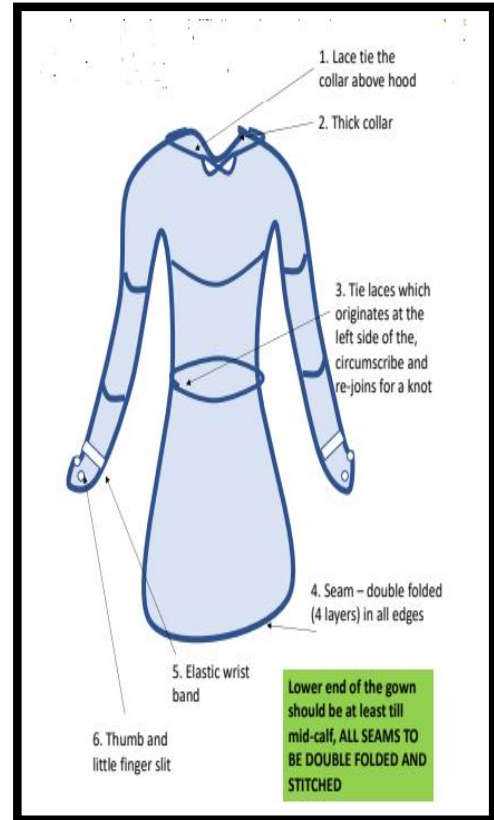


Fig. 3 PPE Gown – Backside View

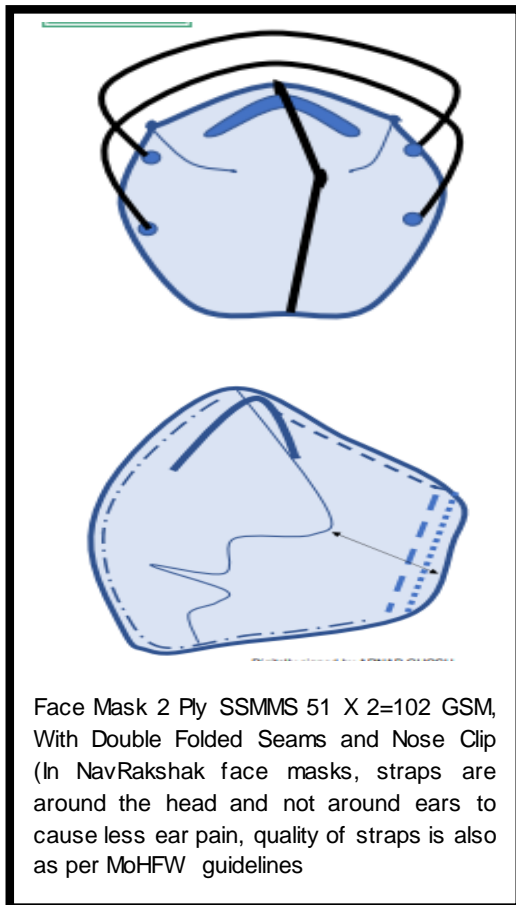


Fig 2. NavRakshak Face Mask

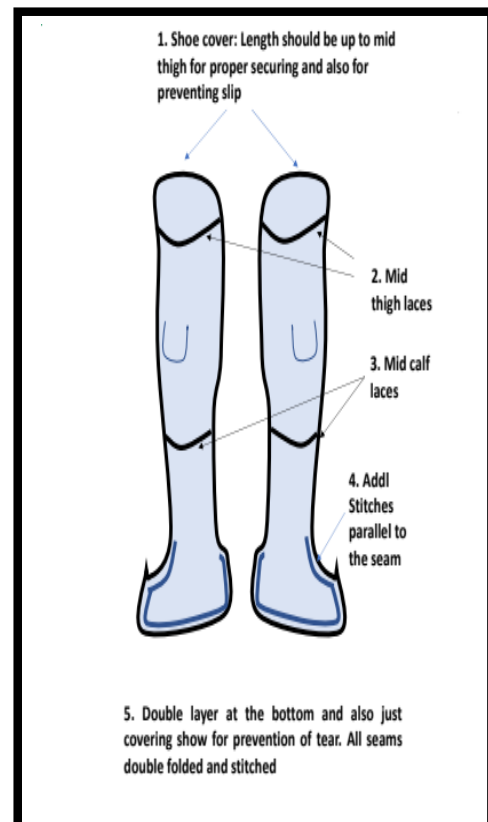


Fig.4 Protective Shoe Cover/Stocking

TECHNOLOGY PROFILE

<p>Salient Technical Features including Competing Features</p>	<p>-- NavRakshak consists of head gear (1 ply 51 GSM SSMMS fabric), 2 plies protective mask of the same material and Coveralls (1 ply =51 GSM)</p> <p>-The innovative hood has a 360 degree wrapping with tuckable base. There is a provision of inserting stethoscope or headphone earpieces (named Phone pouch) through a closed end pouch in the hood.</p> <p>--Two ply facemask (10 layered, 102 GSM density) which is almost two times denser than the N-95 respirator mask.</p> <p>-- Face mask creates tight air sealing generating negative pressure inside (without expiratory valve) and has cup-shaped design with a nose fix.</p> <p>--Offers fluid resistance due to zigzag patterned non-woven fabric, not letting fluid to settle on its surface.</p> <p>--Testing of the Fabric has been done by INMAS (DRDO) and passed by 6/6 SBPR test</p> <p>--Coverall exceeds ISO 16603 class 3 exposure pressure, or equivalent</p>
<p>Level/Scale of Development</p>	<p>Prototype development completed, at Naval Dockyard, Mumbai</p>
<p>Status of IPR</p>	<p>Patent Application has been filed with the Indian Patent Office</p>
<p>Major Raw Materials</p>	<p>--Fabric of specified quality --Elastics for mask and lower end of the sleeves</p>

<p>Major Plant Equipment & Machinery Required</p>	<p>--Normal sewing machines and fabric cutting scissors -<u>Taping of the seam will not be required as the stitched seams have passed the INMAS test</u></p> <p>** (First batch of the PPEs produced under license production to be tested and certified fit by ICMR approved Govt. agencies like INMAS/ SITRA)</p>
<p>Advantages</p>	<p>--Low cost, optimal pathogen protection and easily adaptable design.</p> <p>--Provides optimal breathing comfort to the user while preventing viral exposure.</p> <p>-<u>Innovative Provision for securely inserting stethoscope earpiece or mobile headphones into hood.</u></p> <p>--Easily available raw material in Indian market, 60-80% (anticipated) cost reduction compared to imported PPEs</p> <p>--Low capital investment, easily adaptable by existing Govn manufacturing units</p> <p>--Meets the standard criteria set by ICMR and MoHFW for PPEs</p> <p>--Surgical procedures can also be done wearing the PPE</p>
<p>Transfer of Technology Terms & Conditions</p>	<p><u>Technology Transfer Fee:</u> Rs. 3 Lakhs + applicable GST <u>Recurring Royalty:</u> 5% on Ex-factory Sales <u>Period of License:</u> 3 Years <u>Nature of Licensing:</u> Non-exclusive</p>

NRDC

National Research Development Corporation, an Enterprise of Dept. Of Scientific & Industrial Research, Ministry of Science & Technology, a Govt. of India, is a premier technology transfer organization with over six decades of experience. It has helped establish over one thousand projects in the small and medium scale sector. The supply of technologies and services to entrepreneurs extend both in the developing and developed countries like USA, Germany, Malaysia, Myanmar, Nepal, Senegal, Madagascar, Indonesia Philippines, Vietnam, Lanka, Kenya, Brazil, Bangladesh and Egypt.

NRDC SERVICES

- 1) Process know-how
- 2) Pre-investment studies
- 3) Feasibility / project reports
- 4) Detailed engineering
- 5) Turn key projects
- 6) Equity capital participation
- 7) Training in operation of plants
- 8) Raw materials and products testing

Intellectual Property Facilitation Cell (IPFC)

The Intellectual Property Facilitation Cell (IPFC) of Ministry of Defence was set up under Mission Raksha Gyan Shakti launched by Hon'ble Raksha Mantri in Nov 2018. The IPFC operates under Department of Defence Production / Directorate General of Quality Assurance (DGQA) with the mandate of nurturing Innovation and IP Culture in Armed Forces and Defence Industry. Since its launch in Nov 2018, IPFC has facilitated creation of around 1500 IP Assets, and training of around 25000 personnel in IP Management.

Innovation Cell - Institute of Naval Medicine(IC-INM)

The Indian Navy has established its first ever innovation cell, in January 2020, inside the premises of the Institute of Naval Medicine, Mumbai to recognise and promote Innovations from serving personnel. The innovation cell nurtures and inspires ideas and facilitates Prototyping and Product Formulation.



Further Development Work under Progress- Model hood with integrated face shield

** At present Goggles, Gloves, Face Shields and N-95 Respirators can be procured separately). NavMask is to be used in Low to Medium risk environment or procedures, and N95 to be used in high risk environment or procedure (as per MoHFW guidelines)

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