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**List of Officer from DRDE, Gwalior for COVID-19, Emergency Preparedness**

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## 1. HAND SANITIZER (As per WHO Guideline)

### Specification :

#### Formulation - 1

Content (v/v)	
2-Propanol	: 75.15%,
3% H <sub>2</sub> O <sub>2</sub>	: 4.17%
98% Glycerol	: 1.45%
DI Water	: 19.23%

#### Formulation 2

Content (v/v)	
96% Ethanol	: 83.33%,
3% H <sub>2</sub> O <sub>2</sub> ,	: 4.17%
98% Glycerol	: 1.45%
DI Water	: 11.05%

### Testing Procedures :

- The sanitizers are tested for antimicrobial activity based on contact time with sanitizer and reduction in log count of both gram positive and gram negative bacteria and Bacteriophage (virus stimulant) lysis.
- The alcohol percentage is estimated based on alcoholmeter/hydrometer.
- H<sub>2</sub>O<sub>2</sub> % is estimated based on volumetric titration.



2. MASK :

**SPECIFICATION FOR Advanced FACE MASK (Bio protective)**

S N	Parameters	Test Method/ Standard	Specified Value	Remarks/Test Places
1.	<b>Design Features</b>	<ul style="list-style-type: none"> <li>Design of the mask - Flat &amp; fold with Exhalation valve</li> <li>No interference with mask while wearing goggles.</li> <li>One-way exhalation valve to facilitate longer wearing with low exhalation resistance.</li> <li>Provision of Aluminium nose Clip for Snug Fit.</li> <li>The elastic head band with adjustable fittings should be attached (adhesive/ultrasonic/RF welding/stitching) with the mask</li> </ul>		
2	<b>Size</b>	<ul style="list-style-type: none"> <li>Free Size</li> </ul>		
3	<b>Filtration Medium</b>	<ul style="list-style-type: none"> <li>The mask material is required to be multilayered nonwoven fabric(max. 121 gsm)</li> <li>Silver impregnated nylon nano web of 0.35-0.40 gsm to be deposited on polypropylene melt blown nonwoven fabric (max 20 gsm): <b>Certificate required from supplier/ATIRA Ahmedabad.</b></li> <li>Two such nano deposited layers are to be sandwiched between two layers of polypropylene melt blown nonwoven fabric (max 40 gsm)</li> </ul>		<b>NABL accredited/Govt. Approved lab</b>
4	Biological Filtration efficiency, % Min	<b>ASTM F 2101</b>	<b>99.7</b>	<b>NABL accredited/Govt. Approved lab/ SITRA</b>
5	Breathing (inhalation) Resistance, Max a. Inhalation (@30 lpm) b. Inhalation (@95 lpm)	Using DOP for 0.3 micron ( $\mu\text{m}$ ) size particulate matter	<b>100Pa</b> <b>300 Pa</b>	<b>DRDE/NABL accredited/Govt. Approved lab</b>
6	Exhalation valve leakage test	As per NIOSH procedure :TEB-APR- STP-004 or Equivalent	<b>Leakage shall not exceed 30 ml per minute</b>	<b>NABL accredited/Govt. Approved lab</b>

7	Mass (With fitted Accessories & without packing), grams ,Max		12.0 g	NABL accredited/Govt. Approved lab
8	Life	Shelf life Usage Life	12 months Single use	Certificate from Industry
9	Packing	Mask is required to be packed in polyethylene pouch along with moisture adsorbent (silica gel pouch) and user instructions and month and year of manufacture. Finally 12 such packed masks are to be packed in a card board box.		

**Note: Industry has to submit the compliance certificate/reports to the above specification.**

**Configuration – Suggested, only for reference:**



**Testing Resources:**

**Sr. No. 5 Breathing Resistance using DOP – DRDE, Gwalior**

**Core Filter Material – Nano web based non woven filter developed in collaboration with ATIRA, Ahmadabad: Available from ATIRA (Contact person: Ms. Deepali Palawat: 9868160909/8076915085)**

### 3. BIO PPE (Bio protective coverall with shoe cover)

#### Specification of Bio-protective Coverall

Specification No- DRDE/Bio-Coverall / Specn.-II/2020

Date – 28 March 2020

**Reference:** (i) Min of Health & Family Welfare, DGHS (Emergency Medical Relief) Letter No –Z.28015/17/2020-EMR Dated 02 March 2020

(ii) Min of Health & Family Welfare, DGHS (Emergency Medical Relief) Novel Coronavirus Disease 2019 (COVID-19): Guideline on rational use of personal protective equipment received from DRDO HQ on 26<sup>th</sup> March 2020.

Sl. No.	PARAMETERS	TEST METHOD	Specified Value	Remark/Test Place
1.	Fabric Mass, Gram per Square Meter (gsm)	ASTM D 3776 (other equivalent test method)	65-110	NABL/Govt approved Lab
2	Tensile Strength, N/5cms,Min Machine Direction(MD) Cross Direction(CD)	EN 29073-3(other equivalent test method)	80 40	NABL/Govt approved Lab
3	Elongation,% (Both the Directions),Min	EN 29073-3(other equivalent test method)	40	NABL/Govt approved Lab
4	Resistance to liquid Penetration, Pressure in cm water Column, Min	EN20811(other equivalent test method)	100	NABL/Govt approved Lab
5	Synthetic blood penetration test	ISO 16603 class 3 or equivalent	No Penetration	NABL/Govt approved Lab/DRDE, Stitched/sealed Joints samples will also be tested
6	Dry Bacterial Penetration Resistance Test (Resistance to penetration by biologically contaminated solid particles)	ISO 22612 (2005)	Class 3 (Highest class) Penetration (log cfu) ≤ 1	NABL/Govt approved Lab/DRDE
7	Colour	Visual	White, light Blue or light yellow	Visual
8	Shoe Cover	Each Bio-protective Coverall to be provided with a Pair of shoe cover made of the same material as that of Bio-protective Cover all with elastic on the top for fitment and grip. The shoe covers are of 2 sizes 1 & 2. Size 1 shoe cover is to be packed with M size Coverall/suit, fitting over the Indian shoe size of 8 and size 2 shoe cover is to be packed with L size coverall/suits, fitting over the Indian shoe size of 11.		
9	<b>Garment type</b> a. Single Overall type garment with integrated hood (designed to match the head contour) with elastic around face opening. Front zipper with lock slider and the Zipper should be covered with a storm flap with provision of self adhesive sealing.			

	<p>b. Elastic is also required on wrist &amp; lower leg area.</p> <p>c. Seam length should be minimum possible. Manufactured out of material specified above.</p>
10	<b>Garment sizes</b> 2 Sizes Medium (M), Large (L) as per Min of Health & Family Welfare, DGHS (Emergency Medical Relief) Novel CoronaVirus Disease 2019 (COVID-19): Guideline on rational use of personal protective equipment.
11	<b>Usage Life of the coveralls:</b> Single use
12	<b>Fabrication:</b> Sewing/ Adhesion/ thermal/RF welding /Ultrasonic welding or any other suitable technique or combination of techniques followed by application of Sealing tape in stitched area. The sealing tape should be hot air adhesive type made out of suitable material such that the fabricated joint withstands the Synthetic Blood penetration test, Minimum width of the tape should be 16 mm. Thumb & Finger Loop (One loop in each sleeve To anchor the sleeve in place) made of thin elastic tape.
13	<p><b>Packing and Storage</b></p> <p>a. Each coverall to have a label stuck /printed /embossed on suit itself regarding Size, month &amp; year of manufacturing, manufacturer name and “as per DRDE,Gwalior Specification”.</p> <p><b>b.</b> Each coverall along with a pair of shoe cover of specified size is required to be packed in clean and transparent Polyethene Pouch, sealed at the mouth, in clean condition and must have a coloured printed paper inlay or printing on polythene for information regarding manufacturer, month &amp; year of manufacturing, Instruction regarding usage, storage, disposal, “Manufactured on DRDO Order”, as per DRDE,Gwalior Specification.</p> <p>c. Storage Condition: To be stored under standard packing and storage conditions (Temperature: <math>25\pm 2^{\circ}\text{C}</math> and RH:65±5%)</p> <p>d. Storage Life: 5 years in standard packing, under the specified storage conditions.</p>

Note: Product to be made in neat and clean environment. Vendor to give certificate in this regards.

**GARMENT CONFIGURATION/IMAGE ONLY FOR REFERENCE (Specified parameters/garment features mentioned in the specification are to be met):**



**TESTING RESOURCES:**

SITRA Coimbatore: All specified parameters of specs.

DRDE Gwalior: S. No. 5 of specs synthetic blood penetration

ATIRA Ahmadabad: S. No. 1-4.

**SUGGESTED MATERIALS:**

Material selection is industry choice to meet the specified parameters.

Many materials can be used for bio protective coverall. These can be selected based on availability and specified properties of suit. The present specs. does not limits use of any specific materials. The specification only defines performance parameters. However, few material options are suggested below for reference:

- (i) Three layered laminated fabric with central layer of SMS type non woven of approx. 50 gsm and microporous breathable PE films on both sides each of approx 20 gsm.
- (ii) Approx 20 gm monolithic film in centre and outer side 45-50 gsm SMS type PP non woven water repellent and inner side 20-30 gsm SS/SMS non woven.
- (iii) Three layered laminated fabric with central layer of SMS type non woven of approx. 50 gsm and PE films on both sides each of approx 20 gsm .