



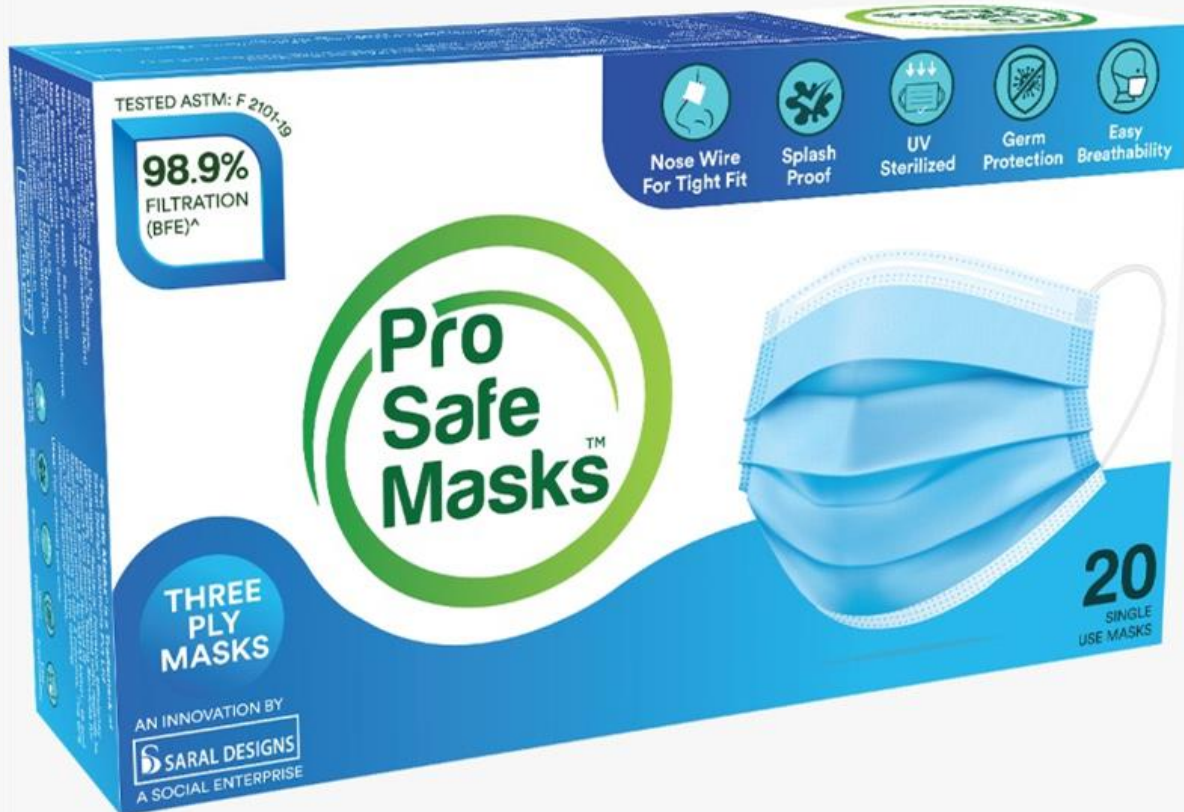
SARAL DESIGNS

Saral Designs is a **National Entrepreneurship Award** winning healthcare startup working on increasing access to high quality personal hygiene products using product design, patented machine technology and innovative distribution. Founded in 2015 by **alumni of IIT Bombay and Madras**, Saral is taking a systematic approach to address challenges in the health & hygiene space.

Saral Designs, having a background of designing the **world's first fully automated compact sanitary napkin manufacturing machine at a decentralized scale**, has developed a high speed fully automatic face mask making machine.

Masks have become an essential commodity in these uncertain times and we understand the importance of a good quality 3 ply mask to prevent onward transmission of germs and viruses.

Thus, at Saral Designs we modified our sanitary pad making machines to produce high quality 3 ply face masks to meet the needs of the masses.



*Introducing*  
High Filtration

# THREE PLY FACE MASKS

A product by



SARAL DESIGNS

98.9% Bacteria Filtration Efficiency



## Key Benefits

Nose Wire for Tight Fit



UV Sterilized



Splash-Proof



Easy Breathability



3 Layers with a Meltblown Filter



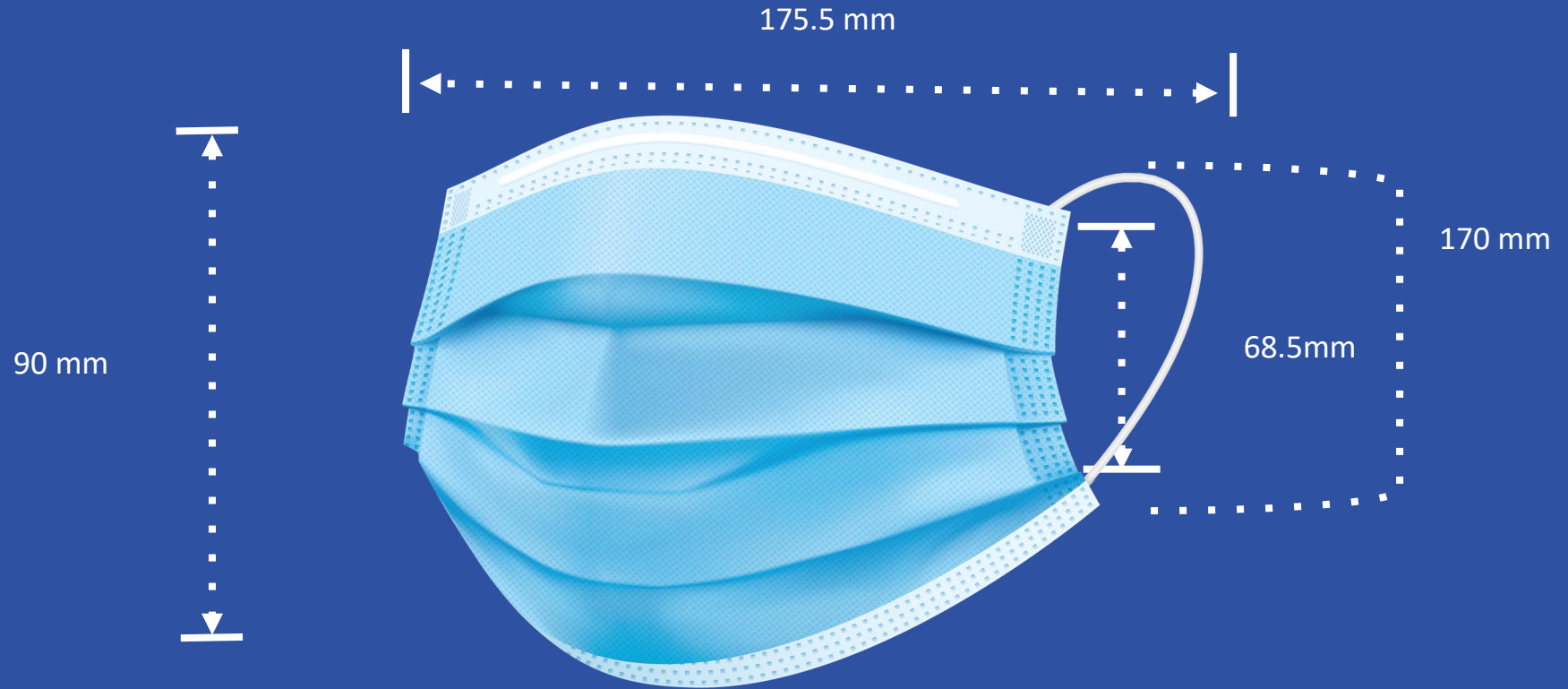


# RAW MATERIALS USED

RAW MATERIALS	DETAILS	PERFORMANCE
Front Layer	20 GSM Spunbond Non Woven	Hydrophobic Front layer filters coarse particles and liquids protecting internal layers
Middle protective Layer	25 GSM SMMS with >95% BFE (Bacteria Filtration Efficiency)	High Filtration Non Woven Fabric filters small particles
Inner Layer	20 GSM Spunbond Non Woven	Soft, comfortable Non Woven Fabric resists moisture
Nose Clip	For tight fit	Provides tight fit for the curve around the nose
Elastic Ear loop	Elastic	Elastic prevents mask from falling of the face



# MASK DIMENSIONS

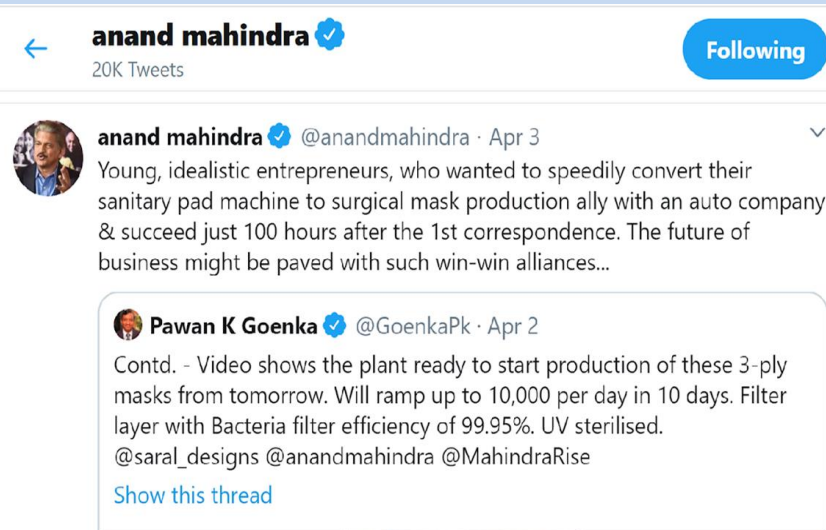


# COMPARISON OF DIFFERENT FACE MASKS



	N-95 (FFP2)	Pro Safe Masks	2 ply masks	Cloth masks
Number of Fabric Layer	5	3	2	2
Filter Layer	2 Needle-punch nonwoven and 1 Meltlown	25 GSM SMMS (SpunMelt blend)	0	0
Fabrics used	2 Needle-punch nonwoven 1 Meltlown 2 Spunbond Nonwoven layers	1 SMMS layer 2 Spunbond Nonwoven layers	2 Spunbond Nonwoven layers	Knitted or woven Cotton/ Nylon
Filtration Efficiency	95% PFE (Particle Filtration Efficiency) of particles upto 1 micron	>98% BFE (Bacteria Filtration Efficiency) of particles upto 3 micron	Can't filter <10 micron particles due to absence of filter layer	Large pore size doesn't provide filtration for <10 micron particles
Nose Wire	Yes	Yes	No	No
Usage	Prescribed for high-risk medical professionals to prevent inward and outward transmission	Prescribed for front-line workers and symptomatic/ asymptomatic patients to prevent onward transmission	Low-risk individuals	Low-risk individuals
Disposal	One-time use, unless UV sterilized for reuse. Should not be washed	One-time use, unless UV sterilized for reuse. Should not be washed	One-time use, unless UV sterilized for reuse. Should not be washed	Washable/ reusable

# 1 MILLION Masks with Mahindra & Mahindra



- With the aim to boost local manufacturing of 3-ply surgical masks, Swachh 7.0 was conceptualized on 15<sup>th</sup> March by modifying the designs of Swachh 4.0 (ultrasonic sanitary napkin making machine)
- Within 15 days of conceptualization, the first machine was been installed at Mahindra and Mahindra's Kandivali factory.
- In 1.5 months, **1 million** masks were produced and distributed to Mumbai, Navi Mumbai hospitals and police staff with support from Mahindra & Mahindra' CSR

# Increasing capacity with Marico Innovation Foundation

Marico Innovation Foundation presents

## INNOVATE2BEAT COVID

SUPPORTED BY @tce CHANDRA FOUNDATION & HARSH MARIWALA

ADVISORS PRAXIS GLOBAL ALLIANCE

🏆 Meet our #COVIDchampions



Modified their patented sanitary pads producing machine to produce 3-ply surgical masks

### Impact:

Large scale production of 10 lakh masks/ month available for general public use

- With support from MIF, we have added further automation to our machines, increasing our production capacity to 40,000 masks per day
- Enabling production of 10 lakh masks per month
- These masks are being distributed to front-line workers and as well as general consumers with general trade in collaboration with Mediker Hand Sanitizers and on e-commerce platforms



# KEY BENEFICIARIES & TESTIMONIALS



## 12,000,000

Masks used by frontline workers

### Maharashtra:

- Brihanmumbai Municipal Corporation (BMC)
- Thane Municipal Corporation (TMC)
- Food and Drug Administration (FDA)
- Food Safety and Standards Authority of India (FSSAI)
- R.N. Cooper Hospital
- Maharashtra Police
- Mahindra & Mahindra, Kandivali factory
- Kharghar Doctor Association
- Swasth (Low-income community) Clinics, Mumbai

**Gujarat:** FDC Limited

**Kerala:** Alappuzha Police HQ

**Tamil Nadu:** CMC Vellore



### MUNICIPAL CORPORATION OF GREATER MUMBAI

H.B.T. Medical College & Dr. R. N. Cooper Municipal General Hospital, Bhaktivedanta Swami Marg, Juhu Scheme, Juhu, Vile Parle (west), Mumbai, Maharashtra 400056.

Date - 06.05.2020

To,  
Ms. Roli Gupta,  
C/O Saral Design Solution Private Limited,  
Mumbai.

Ref: Donation of 3Ply mask (surgical mask) to HBTMC OBGY Dept

Resp. Ma'am,

Thanks for your concern and commitment towards doctors, health care workers protection and the public at large.

As discussed we are happy to receive the donation of 3Ply mask (surgical mask) – 5000 pcs for our doctors and staff.

Thanking you for your interest in this matter.

Dr Reena Wani and Dr Sachin Paprikar are coordinating for OBGY Dept, and will be in touch with you.

Yours Sincerely,

DR. REENA WANI,  
ADDL. PROF. & HOU, DEPT. OF OBGY,  
HBTMC & DR.R.N.COOPER HOSPITAL, JUHU.

# KEY BENEFICIARIES & TESTIMONIALS

Dr Smita – Head, TMC healthcentre



BMC Dpty. Chief Mr. Subhash Dalvi



Maharashtra Police



Dist. Headquarters Alleppey, Kerala



Cooper Hospital- Mumbai



# HIGH SPEED AUTOMATIC MANUFACTURING



## Machine Technology Innovation for low-cost and high speed production of 3ply masks



- **Made in India** using a **fully automatic machine**, Swachh 7.0
- **Ultrasonically sealed** and **UV sterilized** 3-ply surgical masks
- Enabling **Decentralized production** in a small scale set-up

*\*Machine brochure can be shared on request separately*

# KEY SUPPORTERS OF THE MASK PROJECT



Grand Challenges Canada®  
Grands Défis Canada

BOLD IDEAS WITH BIG IMPACT®



MILLENNIUM  
ALLIANCE  
Inspiring Innovation. Sharing Solutions.

Mahindra  
Rise.



सत्यमेव जयते

विज्ञान एवं प्रौद्योगिकी विभाग  
DEPARTMENT OF  
**SCIENCE & TECHNOLOGY**

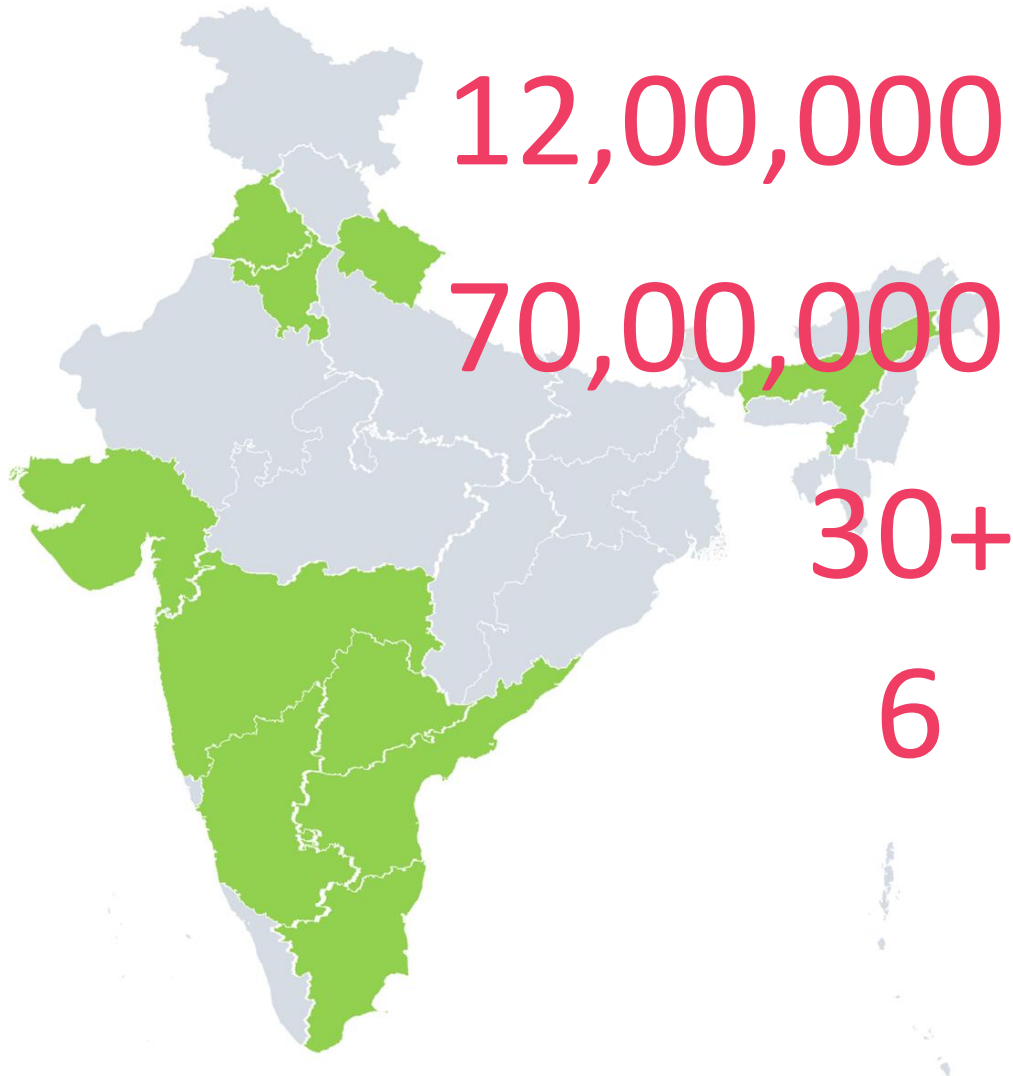


**USAID**  
FROM THE AMERICAN PEOPLE

SAMREIDH  
HEALTHCARE BLENDED FINANCE FACILITY



# 5 YEARS OF IMPACT



12,00,000

Masks sold through Swachh machines

70,00,000

Sanitary pads sold through Swachh machines

30+

Entities including hospitals and government facilities are using masks produced from Swachh machines

6

Countries including India, Bhutan, Rwanda, South Africa, Namibia and Bangladesh produce sanitary pads using Swachh machines



# CERTIFICATIONS



## THE SOUTH INDIA TEXTILE RESEARCH ASSOCIATION

**CENTRE OF EXCELLENCE FOR MEDICAL TEXTILES**  
Physical, Chemical & Biological Testing Laboratories

(ISO/IEC 17025 NABL ACCREDITED)

13/37, Avinashi Road, Aerodrome Post, Coimbatore - 641 014, INDIA



Cert. Number: TC-6944

Test Report No : O2000547      ULR: TC69442001000446P      Report Date : 04-08-2020  
Saral Design Solutions Private Limited      Ref : DT 27.07.2020

<b>ASTM F 2101 Bacterial filtration efficiency</b>	<b>O2000547-1</b> Sample Particulars : Face Mask
<b>Test Condition[s]</b>	.
Test organisms used	<i>Staphylococcus aureus</i> ATCC 6538
Inoculum size	5 x 10 <sup>7</sup> CFU/mL
Media used	Tryptic soya agar
Dilution medium used	Peptone water
Incubation conditions	37°C for 24 h
<b>Results</b>	.
Area of test specimen exposed	Face Mask 10 x 10 cm
Sample exposure side	Face side
Flow rate of aerosol	28.5 L / min
Mean particle size of challenging aerosol	3.0 ± 0.3 micron
Average plate count of positive control	2236
Average plate count of negative control	0
BFE of test specimen (%)	97.9
The sample showed <b>97.9% bacterial filtration efficiency</b> against <i>Staphylococcus aureus</i> ATCC 6538 when tested according to ASTM F 2101 test method.	

<b>Breathability - Differential pressure-IS 16289**</b> IS 16289:2014 Annexure C	<b>O2000547-1</b> Sample Particulars : Face Mask
Pa/cm <sup>2</sup>	22.0

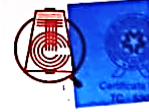
<b>Flammability-16 CFR Part-1610**</b> 16 CFR Part-1610	<b>O2000547-1</b> Sample Particulars : Face Mask
Flammability in Seconds	15.0
Auto Flame Chamber, 45deg inclined	.
Classification	Class 1
Class 1: Average burn time greater than or equal to 3.5 seconds Class 2: Average burn time is 4 to 7 seconds with base burn (Raised fiber surface) Class 3: Average burn time less than 3.5 seconds Samples resulting in a designation of class 1 or 2 meet the requirements of the standard if the sample is designated as class 3, Rapid and Intense burning	

<b>Splash Resistance-ASTM F1862</b> ASTM F1862/F1862M-2017	<b>O2000547-1</b> Sample Particulars : Face Mask
Result at 160mmHg	Pass

\*\* Test(s) not covered under NABL Scope.

- End of Report -

(This is a computer generated report, hence does not require signature.)



प्रयोगशालाएँ  
**वस्त्र समिति**  
वस्त्र मंत्रालय, भारत सरकार  
वस्त्र प्रयोगशाला एवं अनुसंधान केंद्र  
पी. बाबू रोड, प्रभादेवी चौक,  
प्रभादेवी, मुंबई - 400 025

LABORATORIES  
**TEXTILES COMMITTEE**  
Ministry of Textiles, Government of India  
Textile Laboratory & Research Centre  
P. Babu Road, Prabhadevi Chowk,  
Prabhadevi, Mumbai-400 025.

Tel : +91-22-6652 7546 / 545 / 550 / 607 Fax : +91-22-6652 7554  
E-mail : dlab.tex@nic.in / telabmumbai@gmail.com \* Website : www.textilescommittee.nic.in



### TEST REPORT

Format No. 04/26/02

Test Report No: 0111062021-382	Date: 24/07/2020
Name & Address of Customer	Saral Design Solutions Private Limited EL-11, DNA Road, Electronic Zone, MIDC Mahape, Navi Mumbai-400710
Sample forwarding letter No. & date:	Nil
Date of receipt of sample	09/07/2020
Sample Description	Three Ply Mask
Sample Characteristics	Mask
Date of Performance of Test(s)	14/7/2020
Laboratory Sample No.	0111062021-382

### TEST RESULTS

Sample mark	Test Parameters	Result Obtained
S No.		
1.	Differential pressure, at flow rate 8 liter/min IS:16289 ANNEX-C	4.0 Pa**
2.	Splash resistance at pressure 120 mm Hg IS 16289 ANNEX-D	Pass**
3.	Sub-micron particulate filtration efficiency at 0.3 micron,% (Tested on TSI 8130 Instrument)	52.0
4.	Flammability test - Inclined Plane (16 CFR 1610)	Did not ignite*

Remark: \*\*The above parameters are tested at other laboratory.  
\* The specimen melts at point of impingement.

Signature & Seal of the Officer  
Page 1 of 1

**SHIVAKUMAR JIGALWADI**  
ASSISTANT DIRECTOR

**\*\* ISO:17025 Accredited Laboratory \*\***

Sample not drawn by Textiles Committee, Results relate only to the sample tested.  
This test report shall not be published in any form without the explicit written consent of the Textiles Committee.  
Please quote Test Report No. and date for all future correspondence.  
Sample conditioned and tested at a temp. of 27 ± 2° C instead of 21 ± 1° C and 65 ± 2% RH wherever ASTM / AATCC test methods adopted.  
Complaints if any, are to be received within 45 days from date of issue of the test report.



# CERTIFICATIONS



**Name of Test:**  
Bacterial Filtration Efficiency (BFE) of Medical Face Mask Sample Materials, using a Biological Aerosol of Staphylococcus aureus by ASTM: F 2101 - 19

**Test Organism Used:**  
Staphylococcus aureus – ATCC 6538

**Inoculum Size:**  
2.60 x 10<sup>8</sup> CFU/ ml

**Test Equipment:**  
Aerosol challenge Apparatus with Nebulizer assembly and Cascade impactor

**Flow Rate of Cascade Impactor:**  
28.3 L / min

**Aerosol Size:**  
3 microns ± 0.5

**Procedure:**  
Test sample was clamped between cascade impactor and an aerosol chamber at a distance of 15 cms. Bacterial aerosol of bacteria – Staphylococcus aureus were generated in the chamber using the nebulizer assembly. Aerosols of test organisms of size 3 microns were drawn through the test material using a vacuum attached to cascade impactor. Positive control samples collected aerosol with no test specimen to determine the upstream aerosol counts. The ratio of upstream to down stream was reported as Percentage Bacterial Filtration efficiency. Following results are the Average of three readings.

**Results:**

Sample Identification	Average Bacterial count	BFE (Percentage)
Medical Face Mask	30	98.92
Positive Control	2.60 x 10 <sup>8</sup>	N. A.

**INTERPRETATION:**  
Mask sample labeled as Medical Face Mask has exhibited 98.92% Bacterial Filtration Efficiency when analysed as per ASTM: F 2101 - 19 standard.



For BIOTECH TESTING SERVICES

*Shilpa*  
Dr Shilpa U. Nair  
Quality Manager  
(Authorized Signatory)

200102/1/1  
Page 2 of 2

\* Samples are not drawn by the laboratory • Result relate only to the samples tested  
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104/105, Malwa, Patanwala Ind. Estate, L.B.S. Marg, Ghatkopar (W), Mumbai - 400086, INDIA • Tel. : +91-22-2500 2811, 2500 2812  
Email : info@biotechs.in / report@biotechs.in / biotechtestingservices@gmail.com / shilpanair@biotechs.in

An ISO / IEC 17025:2017 Accredited Testing Services [www.biotech.in](http://www.biotech.in)

## Certificate of Registration




### QUALITY MANAGEMENT SYSTEM

**Saral Design Solutions Private Limited**  
EL-11, DNA Road, Electronic Zone, MIDC Mahape, Navi Mumbai - 400710

#### SCOPE

Indigenous Designing, Manufacturing (Assembly and Testing), Selling and Providing After Sales Service of various types of Machines to make Sanitary Napkins and other hygiene products such as Maternity Pads, Baby and Adult Diapers, Underpads, Pantliners, all types of face masks such as, Surgical Masks, Respirators etc., Production, Selling and Distribution of such products and Supply of Raw Materials required for such products.

This is to certify that the Quality Management System of the above mentioned Organization meets the requirement of

### ISO 9001:2015

<b>Certificate Number</b>	MS-A- 9066000420
<b>Date of Initial Certification</b>	08 April 2020
<b>Date of Last Issue</b>	08 April 2020
<b>Date of Expiry</b>	07 April 2021

• Note: Certificate is Valid for 3 Years (08-04-2020 to 07-04-2023) From the Date of Initial Certification. Upon Successful Completion of Surveillance Audit a New Certificate with an Extended Validity shall be issued.

  
 Signed on behalf of M/S OSS Certification Services Pvt. Ltd.  
Rev. 00, 01, 08, 04, 2020





This Certificate is valid when confirmed by data listed in the International Register of Quality Assessed Organizations - [www.irqao.org](http://www.irqao.org)  
The authenticity of this document may be re-confirmed by writing to [info@oss-certification.com](mailto:info@oss-certification.com). Lack of fulfillment of conditions as set out in the Certification Agreement may render this Certificate invalid. Any alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

**M/S OSS Certification Services Pvt. Ltd.**  
[www.oss-certification.com](http://www.oss-certification.com)

Accreditation by the Accreditation Service for Certifying Bodies (Europe) Ltd.  
6, Ferris Place, Bournemouth, Dorset, BH8 0AU, United Kingdom.  
[www.ascb.co.uk](http://www.ascb.co.uk)



# NATIONAL AWARDS AND RECOGNITION

## NATIONAL ENTREPRENEURSHIP AWARD

By the then Home Minister Rajnath Singh  
Ministry of Skill Development &  
Entrepreneurship



## MAHARASHTRA'S MOST INNOVATIVE START-UP

By then Chief Minister of Maharashtra  
and NASSCOM



## TOP WOMAN ENTREPRENEUR AT EMPOWER

Zone Start-ups India &  
Department of Science & Technology



## VISIT BY CHIEF MINISTER OF GUJARAT

At inauguration of Swachh at  
Valsad



## APPRECIATION BY RAHUL GANDHI

At a select panel on MSME consultation



## YES I AM THE CHANGE- AWARD

YES Foundation (YES Bank  
CSR)





# NATIONAL INNOVATION RECOGNITION

**OUTLOOK INDIA HYGIENE INDUSTRY AWARD**  
By BCH for best innovation in hygiene industry



**VISIT BY AAMIR KHAN**  
At inauguration of Swachh at Baramati



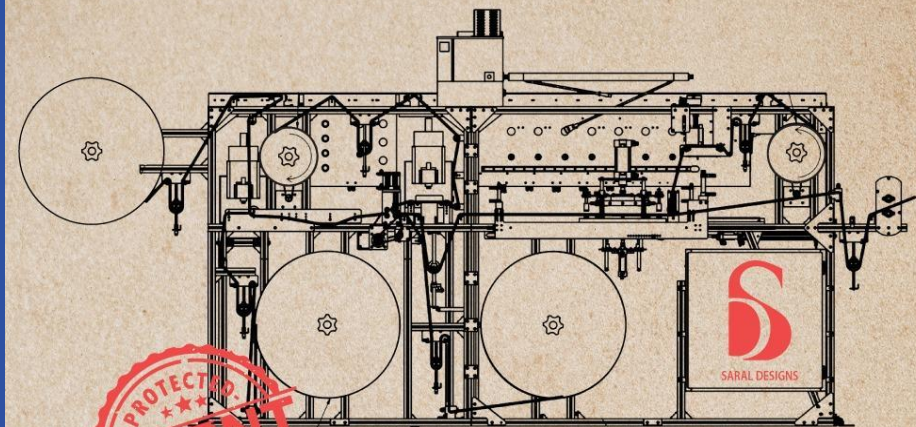
**APPRECIATION BY NOBEL LAURETTE  
KAILASH SATYARTHI**  
At Goalkeepers UN Headquarters



**APPRECIATION BY AMITABH KANT**  
At Global Entrepreneurship Summit



**DEVICE FOR SEALING, SHAPING & AUTOMATING  
A PROCESS OF MAKING SANITARY PADS**



**HAS BEEN GRANTED A PATENT  
BY THE INDIAN PATENT OFFICE**

# INTERNATIONAL AWARDS AND RECOGNITION

## PRIME MINISTER OF BHUTAN

Inaugurates first sanitary pad machine of Bhutan



## UNITED NATIONS ETHIOPIA

Poster presentation with Gates Foundation



## GLOBAL WINNERS OF IMPACT HARDWARE START-UP

American Society of Mechanical Engineers (ASME)



## GLOBAL EMERGING LEADERS AWARD

Acumen Fund, Kenya



## GLOBAL TOP 4 IMPACT ENTERPRISES

UBS Philanthropy Forum, Switzerland



## INDIAFRICA YOUNG VISIONARY

Ministry of External Affairs





## SARAL DESIGN SOLUTIONS PRIVATE LIMITED

EL-11, DNA road, Electronic zone, MIDC, Mahape, Navi Mumbai-400710

+91- 8108139176 | +91-9029330401 | [www.saraldesigns.in](http://www.saraldesigns.in) | [contactus@saraldesigns.in](mailto:contactus@saraldesigns.in)

**Disclaimer:** The contents in the brochure are confidential and are protected under Intellectual Property laws of India with Saral Design Solutions Private Limited as the rightful owner of the information, patents on the sanitary napkin machine and trademark for Active Ultra Healthy Hamesha.