

Project titled

“Development of Keratin based Bio-composite films and electrospun nanofibrous mat from wool waste.”

Point 1: Novelty of product:

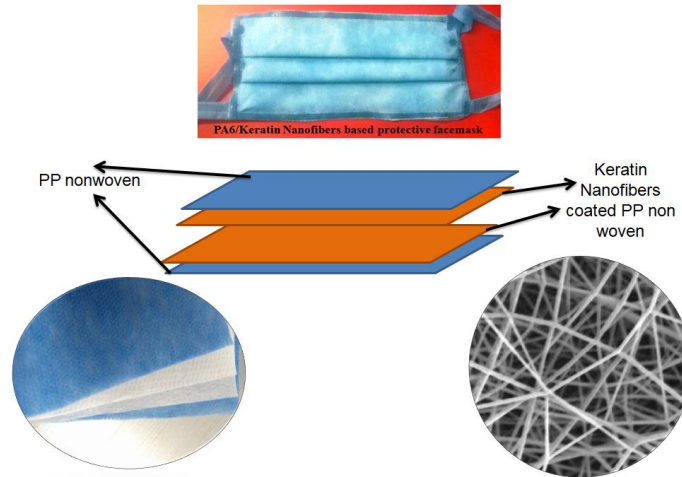
WRA has successfully developed keratin embedded nanofibers based protective face mask. This face mask has unique futures as compared to products available in the market such as,

- Nanofiltration/ultra filtration mechanism
- Having more than 98% filtration efficiency against 0.3 micron particulate matter
- Having 99.99% bacterial filtration efficiency against bacteria *Pseudomonas areus*.
- Absorbs toxic VOC gases
- Cost effective
- Biodegradable

Market comparison:

Type	Product	Particulate filtration efficiency (%)	Bacterial filtration efficiency (%)	VOC absorption	Biodegradable	cost
P1	3M 9000ING Anti Pollution Mask	80	NA	NA	NA	25
	3M 9004 IN Particulate Respirator	80	NA	NA	NA	16
P2	Honeywell PM 2.5 Anti Pollution Foldable Face Mask	95	95	NA	NA	68
	3M particulate respirator 8210, N95 mask, NIOSH	95	NA	NA	NA	97
P3	3M 9332 N99 Pollution Mask Aura	99	99	NA	NA	296
	OxiClear Pollution Mask for Face	99	99	NA	NA	599
	Dettol Air Protect Air Mask	98	99	NA	NA	249
	WRA's developed protective Face mask	98.66	99.99	VOC Absorb	Biodegradable	Less than 50

Point 2: Cross sectional view of development:



Point 3: Publication & Patent in the project

a. Publication:

1. Chetan Mahajan, Girish Kherdekar, Anil kumar Sharma, “Development of Keratin Based Poly Vinyl Alcohol (PVA) Electrospun Nanofibrous Mat from Wool Waste for Air Filtration. International journal of modern trends in Engineering and Research
2. Chetan Mahajan, Girish Kherdekar, Anil kumar Sharma, “Development of Keratin Based Polyamide 6 (PA6) Electrospun Nanofibrous Mat from Wool Waste for Air Filtration. International journal of modern trends in Engineering and Research.
3. Chetan Mahajan, Girish Kherdekar, Anil kumar Sharma, “Development of Keratin Based Chitosan Electrospun Nanofibrous Mat from Wool Waste for Air Filtration. International journal of modern trends in Engineering and Research

b. Patent:

Title of patent: Keratin based polymeric nanofibers for air filtration
Application no: 201821027139

Point 4: Commercialization partner industries:

Industries shown interest in commercialization:

1. Voltimo Bizsol Pvt. Ltd. Ahmedabad.
2. Intech safety Pvt. Ltd. Kolkata.

Point 5: Commercialization status:

Intech group of companies was founded in 1999, it is an ISO 9001:2008 and ISO 14001:2004 certified company, annual turnover is more than 10 crores with product range for personal protection like helmet, goggles, hear protection devices, respirators, gas mask, breathing equipment etc. Intech safety produces world class products of modern innovative user friendly designs providing ultimate safety, user acceptability and comfort.

Intech safety has shown interest to design the face mask based on the WRA's innovation and is in process producing 1000 no. face masks for field trials of certification from Govt. Depts. Industries etc. and for the test market of developed product.

Voltimo Bizsol Pvt. Ltd. Ahmedabad is working in field of safety products to commercialize developed product. It may primarily focus Govt depts. like police, Municipal Corporation, hospitals etc.

Gujarat (Ahmedabad) police department has agreed to perform field trials of face mask for traffic police. Once approved and certified by competent authority, the product may be made available for these depts.