

Amrita Vishwa Vidyapeetham Scientists Launch N96 Nano Mask

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Amrita Nano Mask

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- The unique three-ply N96 Nano Mask based on cutting-edge nanotechnology offers very high levels of breathability on one hand and the highest possible filtration on the other – hardly any other mask in the world does so
- Costing less than Rs 200, the mask can be washed up to 30 times for reuse
- The product, based on nano-materials developed as part of a Govt. of India grant, has been tested by the South India Textile Research Association (SITRA)
- The technology is available for licensing by the varsity for volume production

Scientists of the Centre for Nanosciences & Molecular Medicine at Amrita Vishwa Vidyapeetham have launched a unique three-ply N96 Nano Mask based on cutting-edge nanotechnology. It is cost-effective and offers far superior filtration and breathability than conventional N95 and surgical masks.

The Amrita N96 Nano Mask, costing less than Rs 200, can be washed up to 30 times for reuse. It is long-lasting, skin-friendly, and odor-free, and provides very comfortable wear even for long durations. The fabric makes it effortless for the wearer to breathe in and out even while providing almost 100% protection against harmful microbes. Hardly any other mask in the world offers such high breathability (level 2) with maximum protection (99.9%). Amrita Vishwa Vidyapeetham is offering the technology for licensing to others for volume production and bring the cost of the mask further down.

The Amrita N96 Nano Mask with nano-layered filter is lab tested to provide 99.9% bacterial and virus aerosol filtration as well as 96% particle filtration of more than 3 microns. It has also been tested by the South India Textile Research Association (SITRA), the premier laboratory supported by the Ministry of Textiles, Government of India, to test masks and PPEs in the country.

Said Dr. Shantikumar Nair, Dean (Research) with Centre for Nanosciences & Molecular Medicine, Amrita Vishwa Vidyapeetham: "The Amrita N96 Nano Mask is far ahead of conventional surgical and N95 masks in providing protection to the wearer and enhancing the everyday experience with innovative nanotechnology. It uses a one-of-its-kind nano-engineered filter fabricated with electrospun biofriendly polymer nanofibers. The nano-sized channels and interconnected pores in the nano-filter cause an enhanced 'slip effect' which ensures low air resistance for better breathability on one hand and high filtration efficiency on the other. The specific design of the mask also offers antifogging property. It is an ideal safety gear for healthcare workers and anyone else against infections caused by inhaling harmful bacteria and viruses."

He added: "Some years ago, our Center at Amrita Vishwa Vidyapeetham received a grant from the Government of India to develop nanomaterials for medical applications. As part of that process, we developed a unique nano-fiber-based membrane, textile, and coating. Because of this experience, we were able to incorporate the textile with nano-fiber coating into a polypropylene textile that we have used to develop this nano mask."

Explaining how the mask works, Dr. Deepthy Menon, Professor – Nanosciences, Centre for Nanosciences & Molecular Medicine, Amrita Vishwa Vidyapeetham, said: "The Amrita N96 Nano Mask is a three-layered mask. These layers, made of cloth derived from polypropylene fiber, enclose a nano-fiber membrane between them. The unique hydrophobic nature of this membrane completely blocks the passage of micro-droplets and water aerosols from one side of the layer to the other. This is what protects the wearer from breathing respiratory micro-droplets exhaled by another person and getting infected. This washable, durable and reusable mask ensures 99.9% bacterial and virus aerosol filtration."

Dr. CR Reshmi, the scientist with Centre for Nanosciences & Molecular Medicine, Amrita Vishwa Vidyapeetham, said: "The nano-coating, though sophisticated, involves easy to use technology that is scalable and apt for industrial applications for a variety of filtration products that we are currently working on."