



WORLD WIDE WEAVE

GKD: Pollen filters for performance and endurance athletes

Additional module made from stainless steel mesh for training mask

Technical weavers GKD – Group (GKD) are always on the lookout for new applications where metal mesh helps to make the world safer, cleaner, and healthier. That's why, at the height of the corona pandemic, they hit upon the idea of making a filter mask. As it would have taken far too long to develop a new mask, they focused on optimizing existing masks. The initial idea arose from a pollen filter for the Phantom Athletics training masks, which are widely used internationally in fitness and endurance sport.

These masks played a major part in the immediate success of the niche sport article producer, Phantom Athletics, founded in Austria in 2010. Launched on the market in 2016, they were awarded the ISPO Award for Health & Fitness in 2017, the most important prize worldwide in the sport business. The company has now sold over 80,000 masks. They are worn over the nose and mouth and train the respiratory muscles via a four-stage resistance controller in order to improve stamina and sporting performance. With the additional module developed by GKD, they now alternatively offer an effective pollen filter – another decisive advantage for sports enthusiasts. According to figures from the Robert Koch Institute, 15.6 percent of all adults suffer from hayfever and thereby a disorder of the immune system. Springtime is a time of suffering for them. A study by the German Sport University Cologne determined that pollen allergies are considerably more common in sportspeople than the average population. By spending a lot of time outdoors, they are subjected to constant contact with allergens. If



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medical treatment is not given, this can develop into allergic asthma for many sportspeople over time.

Into series production in record time

GKD developed a filter insert made of die-cut rounds of stainless steel mesh for the Phantom Athletics training mask. After sport, it is cleaned and disinfected for a few minutes in hot water and then dried at room temperature. The filter package consists of five layers of two different meshes centrally fixed with a weld spot. Four specially arranged layers are made from the high-throughput *Volumetric* mesh. With a nominal pore size of 75 µm, they provide virtually resistance-free air flow during sport. For the fifth layer, GKD selected a square mesh with a pore size of 25 µm. The clever interaction of the mesh types and layers provides the necessary separation rates to ensure efficient particle retention. Within just one day, the product team responsible at GKD designed the new filter insert, which is placed inside a two-part plastic housing. This design is based on what is known as the Poka Yoke system to ensure that the user can neither insert the filter module the wrong way round, nor close the housing incorrectly. The prototype of this housing made of temperature-resistant and odor-free polyamide 12 was produced overnight on a 3D-printer so that the new module could immediately undergo a feasibility check and initial practical tests with sportspeople. Phantom Athletics were impressed by the GKD design right away. "We had been thinking about a filter for a long time," remembers CEO Dominique Wenger. "The GKD solution was right on the nose!" He placed an initial order for 2,500 filters with GKD without hesitation and they sold like hot cakes. The repeat order is underway – and a leading discounter has also already expressed interest in the filter.



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Safety through tested particle retention

The efficiency of the filters has been proven in both in-house and official tests. GKD determined the particle retention using a multisizer test. In addition, the filter was tested for its suitability at the Institute for Occupational Safety and Health of the German Social Accident Insurance (IFA) in Sankt Augustin as a virus filter. Birch pollen has a size of 19 to 22 μm , grass pollen between 20 and 40 μm . As pollen grains do not just occur individually but agglomerate, pollen with dimensions between 20 and 60 μm is distributed by the wind. According to the Robert Koch Institute, the coronavirus is largely transmitted by aerosol droplets, which are tiny droplets smaller than 5 μm . Aerosol particles are often only a few nanometers in size, however they can accumulate to fine particulate with a size of 2.5 μm . The filter module developed by GKD for Phantom Athletics may not guarantee reliable protection against coronaviruses, which is why the filter is not approved as a medical product, but for sportspeople, the filter module provides long-awaited, reliable protection against pollen. Now you can pursue your leisure or performance sport whenever you want and as hard as you want without exposing yourself to pollen and risking damaging your health.

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As a privately owned technical weaver, GKD – Group is the world market leader in metal, synthetic and spiral mesh solutions. Four independent business divisions bundle their expertise under one roof: Industrial Mesh (woven metal mesh and filter solutions), Process Belts (belts made of mesh and spirals), Architectural meshes (façades, safety and interior design made of metal fabrics) and Mediamesh® (Transparent media façades). With its headquarter in Germany and five other facilities in the US, South Africa,



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China, India and Chile – as well as its branches in France, Spain and worldwide representatives, GKD is close to markets anywhere in the world.

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