

## **We make nanofibrous masks – March 16, 2020**

### **The state is also interested in them**

Initially, it was supposed to be a few dozen pieces for the internal use of the university, but the information quickly spread further and an avalanche of demand was triggered. Now we are also producing masks for the Liberec Region, and we have already delivered dozens of pieces to the Liberec Regional Hospital. Rector Brzezina discussed the supply of the starting material for the masks with representatives of several ministries and private entities in Prague today.

### **Material for the state**

*"Representatives of ministries have expressed interest in initial textiles with nanofibres. The proposal was such that we would supply this basic matrix and the state would hand over the material to a private company, which would have it sewn into masks in its foreign plants,"* the rector said after today's meeting in Prague, where he met, among others, with representatives of the Ministry of Industry and Trade, the Ministry of Health and the Ministry of Justice.

*"Of course, we are not opposed to this, but the limit is the production capacity. The two plants where we produce the material for the masks can only produce a limited amount of the nanolayer. It is only a few thousand pieces per day,"* adds rector Miroslav Brzezina.

Our scientists are also producing the initial nanomaterial on a completely new machine with a new technology using the method of electrospinning with alternating electric current, which has been in operation at the Faculty of Mechanical Engineering together with the Faculty of Science and Humanities for only a few days. The production of the material for the nano-masks is thus also its test run. The second machine for the production of the matrix for the masks was started up at the Department of Nonwovens and Nanofibrous Materials of the Faculty of Textiles.

### **From the meeting room to the sewing workshop**

The produced nanolayer on the supporting non-woven fabric will be cut by other workers and handed over to an improvised sewing workshop, which was created from the meeting room of the Institute for Nanomaterials, Advanced Technologies and Innovations of TUL (NATI).

Here, 20-30 university employees take turns at their own sewing machines to sew the layers together so that the nanomaterial is inside the masks, sew the weaving and sew the wire that can be used to wrap the masks around the nose.

*"We were sewing even now on the weekend, we take turns here so that there are not too many of us in one room for health and safety reasons,"* says one of the seamstresses, Jana Melicheríková, who otherwise works as a laboratory technician in the nanomaterials functionalisation laboratory at NATI.

*"I know how to sew and it is easy to sew this type of mask, it is the simplest type of mask, the Chinese way,"* says Associate Professor Eva Kuželová Košťáková from the Department of Chemistry, who is sitting next to her and sewing. She adds that many volunteers have also come forward to help in the sewing workshop.

*"There are enough of us for sewing at the moment and we don't want to bring in unknown people. We're trying to keep the environment here as healthy as possible. Hopefully the public will understand that. Thank you very much for the help you have offered us,"* says Eva Kuželová Košťáková and refers all those interested to the website of the Liberec Region, where there is a link to the database of volunteers who are ready to sew.

## **It was supposed to be small, but the demand is huge**

The Department of Chemistry initiated the production of the masks "at home" during the last week, first testing the material, setting up the new machine and the production process.

*"At first, we wanted to supply the masks mainly to university employees, and a university doctor who already ran-out of masks was also interested,"* says David Lukáš from the Bioengineering department of the Chemistry department.

*"But the interest was enormous, it spread quickly, so we increased the production volume. However, our possibilities are limited, we are not a classical factory, so we joined forces with two professional sewing workshops here in Liberec,"* adds Professor Lukáš, adding that the sewing of masks should soon move from the university to the commercial sphere.

The masks, whether sewn at TUL or by outsiders, are then sterilized in our laboratories with ozone or hot air.

*"Hot air at 60° C for an hour and a half to two hours will kill everything and will not damage the polymer from which the nanofibres are made,"* says Petr Mikeš from the Department of Chemistry.

*"Here at our company we are able to sew about 100-200 masks a day, the rest are sewn by external companies. Today we delivered the first batch of dozens of test masks to the Liberec Regional Hospital. They are very interested in the masks there,"* adds Dr Mikeš. The University produces the masks for the Liberec Region, which will coordinate their further distribution. The first 1,000 masks should be handed over to the representatives of the region today, but their production is still in progress. Some of the masks are also being produced for TUL employees. They will be distributed in the next few days as soon as our people can produce them.

## **We will maintain the production of the nanolayer**

It remains true that TUL does not have the technology and certifications to produce "in bulk" masks with certification items used in the health sector, but there is now a great demand for any means of protection, even without certification.

*"At this moment we have mobilised our forces, we are improvising and producing as much material for masks as the speed of the machines and the strength of our workers can handle,"* says Jana Drašarová, Dean of the Faculty of Textiles.

*"All we need is a polymer for the production of nanofibres, a supporting non-woven fabric, a galon and a piece of wire, all of which we have available and secured from our own stock or from suppliers. We should be able to sustain the production of the nanofibre layer for some time,"* says Josef Šedlbauer, head of the Chemistry department at the Faculty of Science, Humanities and Education.

[Nano in a big way was born at the University of Liberec see Impact story Nanofibres from Liberec](#)

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