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The new, more powerful generation of FUTTEC "microwave patchers": repairs a pothole in the road in about 20 minutes. Carefully, in top quality and year-round

FUTTEC company, which has a Czech and European patent for a microwave system for quick, non-invasive and durable repair of potholes on asphalt roads, has already established itself on Czech roads with its technology. And it expands to the world as well: it recently presented the unique technology in Austria, Germany and the USA. In the meantime, the FUTTEC development team is intensively working on the further development of the design solution of its machines: that is why a new generation of "microwave patchers" of the FT3 series is currently hitting Czech roads: they have 60% more power than their predecessors and can repair a pothole measuring 80 x 80 cm in approximately 20 to 25 minutes. In addition, the machines are equipped with an improved heating control system that optimizes the heating of the surface of the pothole. At the same time, the developers fine-tuned the technical parameters of one of the separately usable components of the "microwave patcher" - the microwave furnace. They are now working on the development of an overall ecosystem for repairing asphalt roads using the microwave method, which would also include early detection of potholes, and on the greater use of artificial intelligence and Big Data.

"Since starting the development of the first generation of our "microwave patchers" - the FT3 prototype - we have come a long way and gained a lot of knowledge and experience from working on the roads. Repairs of many thousands of potholes and cooperation with a number of state organizations (from TSK and ŘSD to municipalities) have allowed us to adapt our machines even more to the needs of their users. The result is the third generation of the FT3 series "microwave patcher" and microwave furnace. It is an integral part of it, but it can also be used separately for temporary year-round road repairs, especially roads of the II. and the III. classes, parking lots or warehouse areas," comments Jiří Rušíkvas, founder and owner of [FUTTEC](#), and adds: *"In the development of new generation FUTTEC machines, we have now*



focused on details that contribute to further increasing their performance, improving heating parameters or simplifying maintenance and manipulation. Our intention is that the new generation of 'microwave patchers' will completely fulfil the requirements we have for them on roads, and we could thus proceed to their serial production."

The third generation of the FT3 series microwave patcher

The third generation of the FT3 series "microwave road patcher" is, like its previous version,

intended for preventive non-invasive maintenance of asphalt roads. This machine ensures year-round seamless repair of holes up to 80 x 80 cm in size, for which the FUTTEC company provides an above-standard warranty of three years. The entire system consists of a microwave furnace with a removable reservoir for heating the asphalt mixture (which can also be used separately) and other accessories: a manually guided microwave radiator with an electric drive intended for heating the asphalt layers in the fault area, a steel transport container, a power plant and a compaction plate. *"In the field of development of the new generation of the FT3 series machine, we focused on its basic features in terms of speed, performance and technical parameters facilitating its use in practice. Its power now reaches 14.5 kW, which means it is 60% more powerful than its previous version. The heating rate of the punch edge was reduced to an average of 20 to 25 minutes under standard temperature conditions. Other factors also contribute to the optimization of its operation: more efficient control of the heating of the surface*



of the pothole, accurate diagnosis of the machine to identify its possible defects or even greater adaptation of its design to adverse weather conditions. And that's thanks to a more powerful component air conditioning system and the integration of vents to direct the flow of warm air to dry the repaired surface," explains Dobroslav Rak, FUTTEC's chief designer.

Assemblies of the third-generation microwave patcher of FT3 series with accessories

A third-generation microwave furnace has also been developed, which can be used as part of the "microwave patcher" or as a stand-alone machine. If this device is used separately, it is used for temporary filling of potholes of larger dimensions (i.e. more than 80 x 80 cm) using gently and evenly heated packed asphalt mixture. Using a microwave furnace is fast and economical, but it does not allow heating the repair site (only the supplied asphalt mixture is heated). Therefore, this solution is less durable than the filling of the hole using the FT3 series "microwave patchers". *"The new generation microwave furnace accelerated the heating of 25 kg of packed asphalt mixture by approx. 20% (i. e. from 10 to 8 minutes). However, significant modifications took place mainly in its construction solution and the working space in which the furnace is stored. This made it easier to work with a bag of asphalt mixture, to handle it and to operate it,"* concludes Dobroslav Rak.

What is FUTTEC microwave technology for?

The system of preventive non-invasive pothole repair using microwaves is intended for permanent year-round repairs of asphalt surfaces. It works on the principle of gentle deep microwave heating of the repair site without degradation (burning) of the asphalt mixture and the need for demolition or milling of the road. It can repair defects in the wear layer of the road without creating a leaky joint into which water could flow and further damage it, and without changing the original parameters of the road: the repaired area is thus essentially returned to its original state. Year-round repairs are carried out with the help of unique construction machines: a fleet of "microwave patchers" of the FT3 series or individual microwave furnaces.

About FUTTEC and its patented microwave technology:

The company FUTTEC a.s. was founded in 2011 with the aim of developing a unique system for repairing potholes on roads. The technology, which is the result of many years of research and improvement, was created in cooperation with the Institute of Chemical Processes of the Academy of Sciences of the Czech Republic and VUT Brno. FUTTEC won the Visionaries 2019 award for it in the competition of the same name by the CzechInno association. In addition, it managed to obtain a subsidy of 1.8 million euros from the European Commission under the EU Horizon 2020 program for the commercialization of this innovative technology. FUTTEC is now seeking another EU grant under the EIC Accelerator program.

The patented FUTTEC® technology is intended for the permanent repair of potholes on asphalt surfaces on roads, cycle paths and other asphalt surfaces. It works on the principle of heating asphalt mixtures using microwave technology, which ensures deep heating of the repaired area without degradation of the asphalt mixture. The result is high strength and a long service life of the repaired site. Thanks to this principle, road repair can be carried out all year round, i.e. even in winter. Other advantages of FUTTEC microwave technology include speed, flexibility, efficiency and cost savings as well as human resources, environmental friendliness, health safety and transparency (a protocol is created during the repair, which is a warranty certificate for the repair).

More information:**Crest Communications**

Marie Cimplová, phone 731 613 602, marie.cimplova@crestcom.cz

Kamila Čadková, phone: 731 613 609, kamila.cadkova@crestcom.cz

www.crestcom.cz

FUTTEC

Ondřej Rušíkvas, phone 602 363 204, ondrej.rusikvas@futtec.cz

www.futtec.cz