



PRESS RELEASE

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T-MOBILE AND AGC TEST TRANSPARENT GLASS ANTENNAS AND WINDOWS THAT LOWER SIGNAL ATTENUATION

- Initial testing in Europe successfully completed
- Glass antennas for mobile networks – the ideal solution for historic city centres and densely populated areas
- New window glass featuring a coating that lowers signal attenuation for homes and for example modern railway cars
- Quick solution for improving coverage and increasing the capacity of mobile networks, including 5G

T-Mobile Czech Republic and AGC have successfully completed initial testing of WAVEATTOCH®, a new type of antenna for mobile networks. The WAVEATTOCH antenna was designed for easy installation directly on glazed facades. Once installed, it helps to improve the quality of coverage and the capacity of mobile networks, including 5G, especially in historic city centres, where installing conventional antennas on the walls of houses is inappropriate. Since it is made of glass and therefore transparent, the WAVEATTOCH antenna blends discretely into urban landscapes.

Meeting the capacity requirements of existing mobile networks and future 5G technologies, especially in densely populated areas, is a major challenge for operators. Installing conventional antennas on walls is not only time-consuming and costly, but often impossible due to rules designed to protect cultural heritage in historic city centres. To that end, T-Mobile joined forces with AGC to test the latter's unique and innovative glass antenna.



The antennas were tested together with the another unique AGC solution: WAVETHRU®, a thermal insulation window glass whose surface has been processed to enable radio signals to more efficiently penetrate into and circulate within buildings. WAVETHRU dramatically reduces signal attenuation through the glass by a factor of 10 to 100 (depending on the frequency band of the signal), while retaining its key thermal insulation properties. The solution has potential applications not only in the building industry, but also in other situations where thermal insulation glass with a metallic coating is used and connectivity is required – for example in modern railway cars.

“I like the idea of using glass antennas on a facade and wanted to conduct a proof of concept test in order to understand the benefits, since this can lead to new possibilities in network deployment, especially for historic city centres like Prague. It will also allow us to improve coverage and network capacity in hot spots,” says Thomas Schweinhuber, Head of International Access Engineering at T-Mobile Czech Republic.

“We adapted our solution to the needs of T-Mobile. For example, we added the new 1.8 and 2.1 GHz frequency bands to the existing upper Sub-6 bands (2.6-6GHz). The lessons learned were extremely beneficial for our expansion in Europe,” says Philipp Jaeger, AGC’s Account Manager for Telecom Infrastructure Products.

The test was conducted earlier this year and involved placing WAVEATTOCH glass antennas at a height of approximately 10 meters on the windows of T-Mobile's headquarters in Roztyly, Prague. At the same time, the existing double-glazed windows were replaced with double glazing processed with the WAVETHRU surface treatment to restore high-quality communication in the building. Testing covered the band of 1,800MHz and 2,100MHz especially supporting 4G network for voice and data services. The 2x2 MIMO Panel Antennas used during the test are completely transparent and have a thin frame, and they are easy to miss from outside at first glance.



The initial results showed that the two innovative solutions tested are feasible and functional concepts that could help mobile operators and cities address the growing demand for high-speed mobile Internet access. The test confirmed that WAVETHRU improved signal quality and signal levels in the selected locations.

About AGC Glass Europe, a European leader in flat glass

Based in Louvain-la-Neuve (Belgium), AGC Glass Europe produces, processes and markets flat glass for the construction industry (external glazing and interior decoration), car manufacture and solar power applications. It is the European branch of AGC, the world's leading producer of flat glass. It has over 100 sites throughout Europe, from Spain to Russia, and employs around 16,000 employees. More information on www.agc-glass.eu (corporate site), www.agc-yourglass.com (glass for the construction industry) and www.agc-automotive.com (for the automotive industry).

Wave is a project initiated by AGC, that delivers a range of innovative telecom solutions for better connectivity outdoors in the cities as well as inside the buildings. AGC has a 40 years experience in telecommunication and antenna for automotive and electronics applications. In Europe, solutions for buildings are gradually being rolled out with the goal of being marketed in 2021. More information on www.wavebyagc.com.

About T-Mobile

T-Mobile Czech Republic, a member of the international telecommunications group Deutsche Telekom, is with its almost 6.2 million customers the number-one operator in the Czech market. T-Mobile is an integrated operator: in addition to converged telecommunications services, it offers TV and comprehensive ICT solutions. It provides outstanding services in the high-speed network, which was proved repeatedly by benchmark testing performed by umlaut (former P3) with Best-in-Test seal.

T-Mobile Czech Republic places emphasis on taking a responsible approach to the environment and society. It adheres to fair business practices, helps beneficial applications and services to see the light of day, supports non-profit organizations, small businesses and individuals, and lends a helping hand whenever crisis situations arise. The company's employees serve as volunteers in many places across the entire Czech Republic.

More information about the company is available at www.t-mobile.cz, www.t-mobile.cz/pomahame (information on the company's CSR activities) and www.rozjezdy.cz (T-Mobile Takeoffs of the Year – a program to support small businesses).

Media contacts:

T-Mobile Czech Republic

Jiří Janeček

PR Senior Specialist

T-Mobile Czech Republic a.s.

j.janecek@t-mobile.cz

Tel.: +420 603 424 129

AGC Glass Europe

Niels Schreuder

Public Affairs and Communication

Niels.Schreuder@eu.agc.com

Tel.: +32 497 621 595

Bernard Monville

Head of WAVE Venture

Bernard.Monville@eu.agc.com

Tel.: +32 499 547 574