

AGC contributes DOCOMO's Deployment of Wireless Service Areas Using Glass Antennas to Add Cellular Base Station Functions to Windows

Development of 5G Compatible Glass Antennas Has Also Begun

Tokyo, October 1 2019—AGC (Headquarters: Tokyo; President and CEO: Takuya Shimamura) have announced that NTT DOCOMO, INC. ("DOCOMO") launched a service area expansion for 4G LTE mobile phones using glass antennas*¹ that add base station antenna functions to windows, which AGC jointly developed with DOCOMO. This is believed to be the world's first 4G LTE mobile telecommunications using glass antennas.*²



Installed glass antenna

With the ongoing increase in mobile communication traffic, there is a growing need to install more antennas to establish small cell base stations*³ in high traffic areas. However, installation of small cell antennas onto building roofs or the walls of buildings is often problematic due to limited availability of installable roofs or walls, and also due to the unsightly appearance of streets and neighborhoods littered with antennas. To solve this situation, in November 2018, AGC and DOCOMO had developed a glass antenna that could be attached onto existing windows (on the interior side) to establish a wireless service area on the exterior side*⁴.

This resulted in the world's first-ever launch of a service area expansion for 4G LTE mobile phones by using glass antennas. It has been verified that the service area secured is equivalent to that of a regular small cell base station*⁵.

AGC and DOCOMO are also working towards the development of 5G-compatible*⁶ glass antennas to use it for expansion of commercial 5G service DOCOMO plans to launch in 2020. The two companies will continue to improve the communication environment in places where installation of small-cell antennas is limited, and to establish more comprehensive 5G coverage areas. The development of 5G glass antennas is planned to be completed by the end of 2019 aiming to be used in DOCOMO's commercial 5G service in 2020.

— **Notes:**

- * 1 AGC product name: WAVEATTOCH™
- * 2 Based on research by DOCOMO and AGC.
- * 3 Base stations that create a small service area within the area of a regular base station, installed mainly in high-traffic areas.
- * 4 Release: https://www.agc.com/en/news/detail/1198204_2814.html
- * 5 Area radius of roughly 100–200 meters (depending on installation environment)
- * 6 3600–3700 MHz, 4500–4600 MHz

— **Reference**

■ **Glass Antenna Summary**

1. Glass Antenna Features

- Does not spoil the appearance of streets or neighborhoods due to being a transparent glass antenna installed onto an existing window.
- Installation is carried out inside buildings, eliminating the need for scaffolding or foundation work.
- These glass antennas for small cells provide flexibility for area design due to their ability to be installed almost anywhere and their beam-forming technology.
- Decreases attenuation and reflection of radio waves passing through existing window glass by using a newly-developed Glass Interface Layer.
*A technology that elicits the original performance of antennas by mitigating the negative effects on performance caused by the proximity of glass antennas to glass.

2. Glass Antenna Specifications

Base specifications

Dimensions	850 mm × 212 mm
Weight	About 2.5 kg

*Size and weight of antenna glass only. Excludes cables, fittings for existing glass, and accessories.
Specifications contained in this news release are current at the time of release and subject to change without notice.

<Glass antenna unit specification (with tilt angle 20°/30°type)>

Frequency	3.44–3.52 GHz band
Gain	Around 9 dBi*
FWHM (vertical-plane)	About 30 deg.
FWHM (horizontal-plane)	About 30 deg.
F/B ratio	Minimum 12 DB
Power handling capacity	Maximum 1.5 W
VSWR	Maximum 2.0

*Depends on model

■ Company Outlines

AGC	
Company name:	AGC Inc.
Representatives	Takuya Shimamura, CEO & Executive Officer
Address	Shin-Marunouchi Bldg., 5-1, Marunouchi 1-chome, Chiyoda-ku, Tokyo
Capital	90,873.00 million yen (as of December 31, 2018)
Established	September 8, 1907
Number of employees	6,659 non-consolidated, 54,101 consolidated (as of December 31, 2018)
Primary business activities	<ul style="list-style-type: none">▪ Glass business▪ Electronic business▪ Chemicals business▪ Ceramics business▪ Other business