

March 20, 2018

### **AGC to Unveil Sound-generating Glass at Milan Design Week 2018**

—Transparent Glass Generates Sound to Create Innovative Soundscapes—

**<Tuesday, April 17 to Sunday, April 22, 2018 at Ventura Centrale in Milan, Italy>**

AGC Asahi Glass (AGC; head office: Tokyo; CEO: Takuya Shimamura), a world-leading manufacturer of glass, chemicals and high-tech materials, announced today that they will debut their sound-generating glass to the world during Milan Design Week 2018, which is held from April 17 to 22 in Milan, Italy.



Simulated image of the AGC soundscape installation made using sound-generating glass

Sound-generating glass, which is currently under development at AGC, is designed with a special intermediary layer that mitigates the inherent resonance characteristics of glass. This makes it possible to produce clear, steady sounds ranging from high to low, throughout the spectrum of audio frequencies. According to Satoshi Takada, General Manager of AGC's Business Development Division, "Glass is an important and prominent element in many spaces, and we have adapted it to changes in lifestyles by introducing sound-generating functionality. This addition is part of our efforts to design new, unprecedented types of soundscapes using glass."

AGC worked with up-and-coming architect Motosuke Mandai as a creative partner to make Milan Design Week 2018's "soundscape" experience-style glass-space installation. "We designed our soundscape by combining transparent glass suspended gracefully in the air with the invisible element of sound," explains Mandai. "I hope visitors to our installation will fully take in the auditory landscape of this space, which is made using the ephemeral, perpetually beautiful, transparent material known as glass. By doing so, they can experience sound in entirely new ways."

AGC is a world leader in architectural glass, automotive glass and display glass. At Milan Design Week, AGC, together with designers in the fields of architecture, interior design, product design and spatial presentation, has explored and will continue to explore new uses and possibilities for glass and enrich people's daily lives through advancements and new possibilities in the glass field.

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#### **Inquiries Concerning AGC and its Products:**

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## <Reference>

### Concept

Our spatial design incorporates the invisible element of sound.

We created a space where time seems to stand still, with a large pane of glass fragmented and dispersed in the air. It is permeated by a sense of transient beauty experienced as, in one short moment, the glass is tensed and ultimately liberated from its structural equilibrium.

Only the sounds persist, moving softly as time remains stopped—the sounds of these numerous glass fragments as they recombine themselves into three-dimensional auditory sensations to create a new soundscape. The sound pours down like rainfall, flows through the space like a river, surges forth like waves, forming within the translucent glass-filled space invisible "chambers" of sound.

By overlaying these two elements—transparent glass suspended gracefully in the air, and the sounds which subtly vibrate that invisible air—we seek out new possibilities for the ephemeral, delicate, graceful medium of glass.

Motosuke Mandai

### Profiles of Creative Partner

This year's Creation Partner is up-and-coming Japanese architect Motosuke Mandai.

His first architectural design after establishing his own practice was Oshika fisherman's house, a Great East Japan Earthquake restoration project built as a center for restoring the fisheries industry in Ishinomaki, Miyagi Prefecture. His desire was to create a new future for the town together with the residents, who would gather in this building. The result is a space that facilitates communication among and involvement by Ishinomaki residents. The interiors and installations have been designed so that the fixtures have been minimized both in form and presence - as far as practicable - as part of Mandai's attempt to push the boundaries of what constitutes a building. He creates a space in which those entering the building encounter and experience a unique space filled with well-thought details in which there is a sense of floating.

Mandai has explored both the limits in which a building can, indeed, be a building and the rich and abundant relationship between buildings and people. He does not believe in coming up with designs that are deliberately unconventional but instead seeks out the ordinary within which a "new landscape" can be created. This mindset resonated with AGC Asahi Glass, which led to AGC commissioning an experimental installation depicting a new "Soundscape".



#### **【Profile】**

#### **Motosuke MANDAI (Architect) / Mandai Architects**

After completing post-graduate studies at the University of Tokyo's Graduate School in 2005, Mandai worked at junya.ishigami + associates before establishing Mandai Architects in 2012. He was Design Assistant at Yokohama Graduate School of Architecture (Y-GSA) from 2012 to 2015, and since 2016 also lectures part-time at the University of Tokyo. He has received numerous awards including the DSA Spatial Award Grand Prix and the JCD Design Award's Gold Prize. <http://mndi.net>

Major works:

Oshika fisherman's house, a center for the restoration of the fisheries industry in Ishinomaki, Miyagi Prefecture, devastated by the Great East Japan Earthquake,

Cutlery Shop KIYA Nihonbashi Main Store IZUTUKI

Exhibit of Food Templates – Dashi at ATELIER MUJI

Music of the Earth exhibition at ATELIER MUJI.

## New Technology: Sound-generating Glass

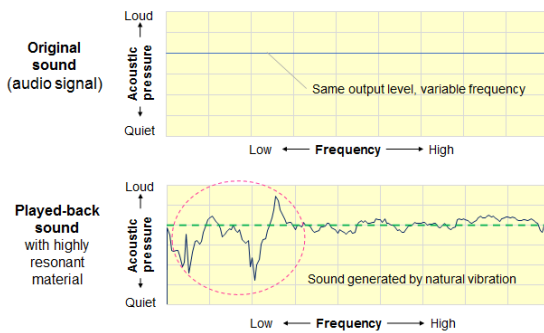
AGC's sound-generating glass is a new type of laminated glass with a special intermediary layer sandwiched between two glass layers. This mitigates the inherent resonance characteristics of glass to enable production of clear, steady sounds over a wide range of audio frequencies, from high to low. The company created this new material as part of efforts to achieve high-quality sound production with glass as a medium—a material that is used in building construction, furniture and many other applications. AGC uses sound-generating glass to pursue new possibilities through the building of auditory spaces known as soundscapes.

### 1. Which Speakers Have High Audio Quality?

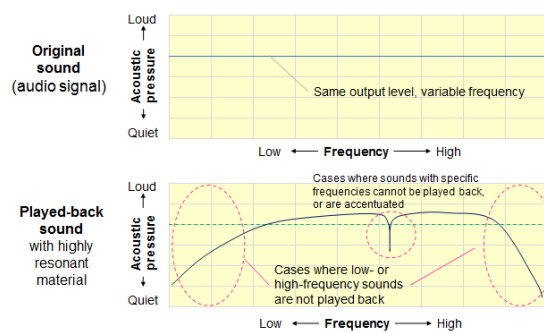
#### Speakers that faithfully re-create sounds:

- No undesired noise on top of original sounds (from resonance or reverberations), meaning high sound clarity
- Capable of reproducing both high- and low-frequency sounds over a wide range

#### ■ Noise caused by resonance

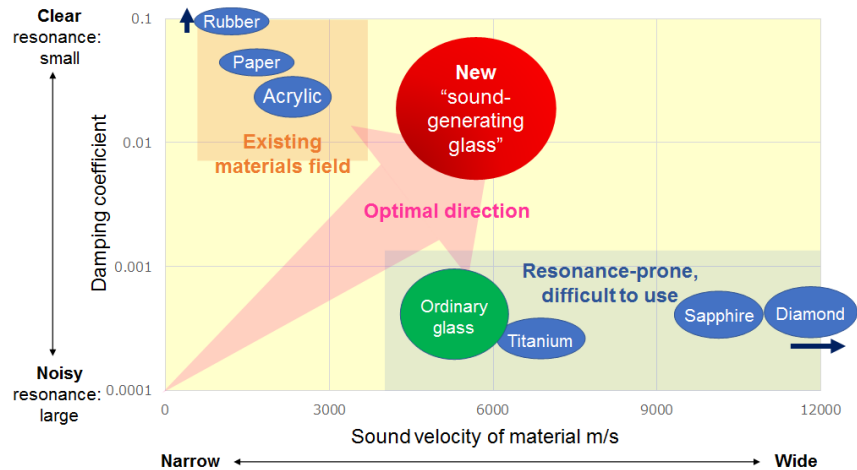


#### ■ Wide frequency range

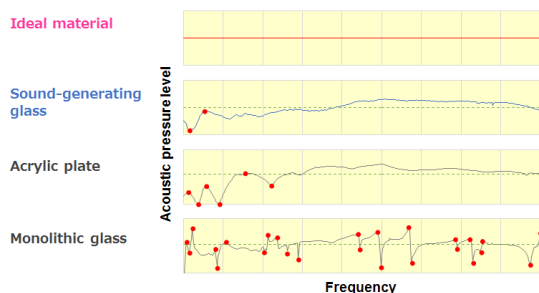


Resonance: Vibrations caused at certain frequency ranges, depending on size and material type. The resonance frequency is a phenomenon in which sounds become louder within a specific, limited frequency range.

### 2. Material Characteristics



### 3. Acoustic Characteristics of Sound-generating Glass



- “Sound-generating glass” has frequency characteristics close to flat → **clear / wide bandwidth**
- Acrylic plate shows remarkable acoustic pressure fluctuations in low frequency range → **clear / narrow bandwidth**
- Large number of resonance peaks are observed in monolithic glass panel → **strong resonance noise**

## Sound-related Research and Development for Glass

Recent years have brought numerous changes and new demand in the field of spatial design, with novel products such as speakers that emit sounds, and light fixtures that emit light, from surfaces rather than single points, as well as new ideas including acoustic design in which sound seemingly rains down from the ceiling as a whole. These present new possibilities for glass, which is used in windows, walls, ceilings, floors, lighting, furniture, mirrors and a wide range of other applications. In response, AGC is pursuing R&D on the interrelationships between sound and glass, both in terms of blocking and generating sound, based on the company's technologies and knowledge in sound insulation and soundproofing fostered through many years of providing construction materials.

## About the AGC Group

AGC Asahi Glass (or also called AGC, Registered Company name: Asahi Glass Co., Ltd., Headquarters: Tokyo, President & CEO: Takuya Shimamura) is the parent company of the AGC Group, a world-leading glass solution provider and supplier of flat, automotive and display glass, chemicals, ceramics and other high-tech materials and components. Based on more than a century of technical innovation, the AGC Group has developed a wide range of cutting-edge products. The Group employs some 50,000 people worldwide and generates annual sales of approximately 1.5 trillion Japanese yen through business in about 30 countries. For more information, please visit <http://www.agc.com/en>.

## 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](http://www.agc-glass.eu) (corporate site), [www.yourglass.com](http://www.yourglass.com) (glass for the construction industry) and [www.agc-automotive.com](http://www.agc-automotive.com) (for the automotive industry).

## Milan Design Week

The "Milan Design Week", one of the largest design festivals in the world, has been held every April in Milan, Italy since 1961. Approximately 1,000 events (Fuori Salone) in which designers and other creative people compete with unique designs are held simultaneously during the festival at various locations in Milan, and all of these events are now collectively called "Milan Design Week."

## Overview of AGC's exhibition at Milan Design Week 2018

■ Title	Soundscape	
■ Dates/Times	General Public	April 17 (Tue) – 22 (Sun) 2018 (6 days) 10:00 – 20:00 * Until 5:00 p.m. on Apr. 17 (Tue.) and until 6:00 p.m. on Apr. 19 (Thu.) and 22 (Sun.)
	Press Preview	April 16 (Mon), 2018 15:00 – 19:00
■ Venue	Ventura Centrale Address: Via Ferrante Aporti 13, 20125 Milano	
■ Venue space	Approx. 290m <sup>2</sup>	
■ Sponsor	AGC Asahi Glass (AGC)	
■ Creative partner	Motosuke Mandai (Mandai Architects)	
■ Music and sound composition	Takashi Tsuda	
■ Sound space design	Yuji Tsutsumida	
■ Graphic design	Ken Okamoto (Ken Okamoto Design Office Inc.)	
■ Special website	<a href="http://www.agc-milan.com">http://www.agc-milan.com</a>	
■ Hashtag	#agc_soundscape	