agculture by AGC

Advanced glass solutions for the next generation of greenhouses

fountain

High-quality glass for all climates

At AGCULTURE™ we provide advanced glass solutions for the next generation of greenhouses.

AGCULTURE™ offers a broad portfolio of glass products suitable for a wide range of vegetables, plants and flowers, such as tomatoes, cucumbers, medical cannabis and orchids, to name just a few. We will be delighted to analyse your request and come up with the best solution for your specific needs.

fountain

Fountain, a low-iron float glass featuring a specially treated surface, delivers superb hortiscatter. It is also available with a double-sided anti-reflective coating

Fountain distributes light evenly throughout the greenhouse so it is available to every single leaf and crop. The result is better crop health, yield and uniformity.

Key properties

Hemispherical light transmission (T_{Hem}) and anti-reflective coating

❖ Our highly durable anti-reflective coating delivers high hemispherical light transmission (average light transmission all year round). **The higher the T_{Hem}, the higher the crop yield.**

Hortiscatter

❖ Fountain's superb hortiscatter delivers **even light distribution**, **reducing shade** and **ensuring uniform crop growth**. This not only prevents leaves from burning, but also makes them grow more horizontally, resulting in greater light capture and a higher yield.

Hydrophilic glass

❖ In cold climates, the inner side of the glass in greenhouses is wet about 90% of the time. With hydrophobic glass, condensation occurs in the form of droplets, thus reducing light transmission. By contrast, **water spreads uniformly on hydrophilic glass**, resulting in higher light transmission. This increase will vary depending on the hortiscatter level, thus enabling growers to maximise their crop yields.

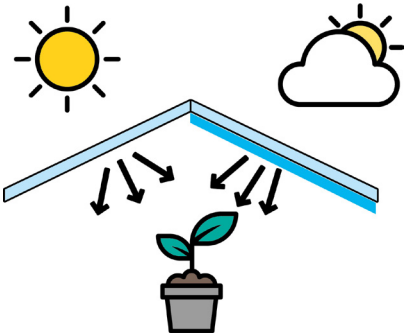
❖ No "rain effect" inside the greenhouse.

❖ Hydrophilic surface guides the water towards gutters, allowing it to be recaptured and recycled.

Durability

❖ Our anti-reflective coating not only maximises light transmission, but also **protects the glass from the corrosion** that is very likely to occur when the glass surface is regularly exposed to water. Moreover, the anti-reflective coating is **not damaged** by brush cleaning on the outer surface of the glass or pressurised solution cleaning on the inner surface, thus ensuring the glass continues **to deliver superb performance throughout the entire lifecycle of the greenhouse**.

How it works



Hot and sunny day (dry glass)
Benefits of scattered light

❖ Light reaches even the lower leaves, causing them to grow more horizontally[1].

❖ Homogeneous distribution of light allows uniform crop growth.

❖ Lower leaves contribute more to photosynthesis.

❖ Higher yield.

Cold and cloudy day (wet glass)
Benefits of more direct light

❖ The film of water does not reflect incident light in the same way droplets do, thus increasing light transmission compared to hydrophobic surfaces.

❖ Higher yield.

Did you know?

1% more T_{Hem} (hemispherical light transmission) = approximately **0.8% higher yield**[2]

10% more hortiscatter = approx. **3% higher yield**[1,3]

These values are valid for tomatoes, with the hortiscatter rule tested up to 45% hortiscatter.

Operational excellence and high-quality production

❖ At AGC Glass Europe, glass is produced, etched and/or coated, processed and packed in-house for delivery to growers. The **quality** of your glass is carefully **monitored from start to finish.**

Compliance

❖ Our basic glass complies with EN 572-2 (latest version) - Glass in building - Basic soda lime silicate glass products - Part 2: Float glass.

❖ Our thermally toughened products comply with EN 12150 (latest version) - Glass in building - Thermally toughened soda lime silicate safety glass.

❖ Our coated products comply with EN 1096 (latest version) - Glass in building - Coated glass.

[1] Li, T., Heuvelink, E., Dueck, T.A., Janse, J., Gort, G. and Marcelis, L.F.M., 2014. *Enhancement of crop photosynthesisby diffuse light: quantifying the contributing factors*. Ann. Bot. 114, 145-156.

[2] Marcelis, L.F.M., Broekhuijsen, A.G.M., Meinen, E., Nijs, E.M.F.M. and Raaphorst, M.G.M. 2006. *Quantification of the growth response to light quality of greenhouse grown crops*. Acta Horticulturae 711, 97–104. doi:10.17660/ ActaHortic.2006.711.9.

[3] https://wiki.groenkennisnet.nl/display/KAS/Diffuus+licht+en+gewas

Performance

Glass (4mm)	T_{Par} [d,e] (± 1%)	T_{Hem} [d,f] (± 1%)	Hortiscatter[g] (± 5%)
Fountain[a,c], Ultra-low hortiscatter, 2xAR[b]	96.5%	85.5%	15%
Fountain, Low hortiscatter, 2xAR	96.5%	84.1%	27%
Fountain, Mid hortiscatter, 2xAR	96.5%	83.0%	38%
Fountain, High hortiscatter, 2xAR	96.5%	80.6%	63%
Fountain, Ultra-low hortiscatter, 1xAR	94.0%	84.5%	15%
Fountain, Low hortiscatter, 1xAR	94.0%	83.1%	27%
Fountain, Mid hortiscatter, 1xAR	94.0%	82.0%	38%
Fountain, High hortiscatter, 1xAR	94.0%	79.6%	63%

[a] Fountain is a low-iron float glass which is chemically etched on one side and coated with AR coating(s)

[b] AR is the anti-reflective coating

[c] All products are fully thermally toughened (tempered)

[d] The values were measured after tempering process

[e] PAR: photosynthetically active radiation

[f] T_{Hem} (hemispherical light transmission) is the total transmission of light through a hemisphere over the observer or target, distributed equally over the hemisphere surface.[2]

[g] Hortiscatter is the integral value of geometrical distribution of light intensity, as measured by the bi-directional transmittance (or reflectance) distribution function (BTDF) under a given angle of incidence of incoming light beam (3D data).[1] Our hortiscatter is measured and certified by Wageningen University and Research.

PAR, T_{Hem} and hortiscatter are measured according to standard NEN 2675 + C1:2018 by Wageningen University and Research (WUR).

Availability

Thickness: 4.0 mm (± 0.2 mm) and 5.0 mm (± 0.2 mm)

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AGC Glass Europe has representatives worldwide

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