AGC products for ZEB family

Yusuke Mori, Ph.D.,
AGC Asia Pacific Pte Ltd (AGC Inc.)
Introduction of AGC

AGC Group (Net sales JPY 1,522.9 billion (FY2018))

Glass
- Flat Glass
  - Float Flat Glass
  - Low-E glass
  - Fabricated glass for architectural (Heat insulating/shielding glass, Disaster-resistant/Security glass, Fire-resistant glass)
- Polished wired glass
- Interior / Decorative glass

Electronics
- Display
  - Glass substrate for display devices
  - Specialty glass for display applications
  - Glass for Solar Power System

- Electronic Materials
  - Semiconductor process materials
  - Optoelectronics materials
  - Lighting glass products
  - Laboratory glass

Chemicals
- Chlor-alkali & Urethane
  - Raw materials for vinyl chloride polymer
  - Caustic soda
  - Urethane

- Fluoro-chemicals & specialty chemicals
  - Fluorinated resins
  - Water and oil repellents
  - Pharmaceutical and agrochemical intermediates
  - Iodine-related materials

Ceramics/Other
- Ceramic products
- Furnace Engineering

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Definition of ZEB (Zero Energy Building)

**ZEB Ready**
(Energy Saving: 50% or More)

**Nearly ZEB**
(Energy Saving: 75% or More)

**ZEB**
(Energy Saving: 100% or More)

Achievement of ZEB ready by Energy Saving: 50% or More

Energy generation by renewable energy source

Nearly ZEB, ZEB (Net Zero)
Energy Efficiency
Load reduction (Improvement of thermal insulation and solar shielding)

Stopsol  Sunergy
Stopray  T-Sunlux

Energy Generation
Renewable energy
Eco Glass: Coated Glass

**Coated Products**

- **Pyrolytic Coating (Hard/Online Coating)**
  - Solar Control Reflective
    - Stopsol Classic
    - Stopsol Supersilver
  - Solar Control Low E
    - Sunergy Clear, Cool, Tinted
    - Sunergy Sigma
    - Planibel G (Low E only)

- **Magnetron Sputtering Coating (Soft/Offline Coating)**
  - Solar Control Reflective
    - T-Sunlux
  - Solar Control Low E
    - Stopray Ace
    - Stopray Vision
    - Stopray Smart
Solar Control – Reflective Coating

Coated on Clear Float Glass

The Ninth CS120
SET CS130
COSMO CS130
Emquartier CS120
K-BANK CS214
UTCC CS530

on Ocean GREEN
on Sky BLUE

Light Reflective Glass with Neutral Grey getting more popular to keep building looks brighter but continued energy efficiency with proper SHGC

→ GREEN & BLUE tone, still good choices for Corporate Images/Preference
STOPRAY – global products LOCAL Accessibility

Q-Condo (Clear Vision + SMART51)

- 13.52#4+A12+6
- VLT: 51%
- SHGC: 0.30
- U-value: 1.7 w/m²

ICONSIAM (SMART51)

- 13.52#4+A12+6
- VLT: 49%
- SHGC: 0.28
- U-value: 1.7 w/m²

MS Siam Tower (Vision50)

- 13.52#4+A12+6
- VLT: 45%
- SHGC: 0.25
- U-value: 1.6 w/m²

MEA (ACE42T)

- 13.52#2,#4+A12+6
- VLT: 40%
- SHGC: 0.23
- U-value: 1.6 w/m²
### Energy Efficiency

**Wall type:** Autoclave Aerated Concrete

**Glazing type:** 3 types

- **Clear Float Glass**
- **T-Sunlux CS520 / coat on Blue**
- **Stopray Vision 40/40T**

**WWR (Window to Wall Ratio) = \( \frac{\text{Area(window)}}{\text{Area(window + wall)}} = 0.5 \)**

**N:E:S:W = 2.5 : 1 : 2.5 : 1**

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<th>50 W/m²</th>
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<th>40 W/m²</th>
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HALIO SMART-TINTING GLASS SYSTEM: BREAKTHROUGH TECHNOLOGY

From Clear | To Dark | And In-Between | Seamlessly

- **Natural clear state** allows over 66% light transmission
- Blocks up to 99.9% total transmitted light with a dark neutral grey state
- **Uniform switching** makes intermediate tints usable and offer a high Color Rendering Index > 90
- **Full switching under 3 minutes** provides energy efficiency and near-privacy. Visible transitioning within 20 seconds
Example:
Smart tinting glass laminated between two Clearvision 4mm Tempered – 15mm 90% Argon – Clearvision 4mm with Iplus Top 1.1
HALIO SYSTEM ENABLES TO CONTROL NATURAL LIGHT REMOTELY

- Natural light switch
- Mobile app
- Control algorithm
- Light sensor

3rd party integration (connected devices or Data sources)

Halio cloud platform

Tint or bleach windows

Monitoring dashboards
Thank you very much for your attention.

Yusuke Mori, Ph.D.,
AGC Asia Pacific Pte Ltd (AGC Inc.)
Strategic Planning & Business Development Division
Global Technology Networking
460 Alexandra Road, PSA Building #32-01,
Singapore 119963
Tel: +65 6273 5656  DID: +65 6277 4241
Mobile: +65 8522 1349
Email: yusuke-mori@agc.com
http://www.agc.com/english/

Songpol Bumpensanti
AGC Flat Glass (Thailand) PLC.
Sales & Marketing Office
200 Moo 1, Suksawat Road, Pak Khlong Bang Pla Kot, Phra Samut Chedi, Samutprakarn, Thailand, 10290
Tel: +66 02-815-5000 #1303  FAX: +66 02-815-7375
Mobile: +66 081-485-5848
Email: songpol.bumpensanti@agc.com
https://agc-flatglass.co.th/