

High Performance Façade in Tropical Climates

Timothy SOEBROTO
Meinhardt Façade Technology
22 November 2019

MEINHARDT

HIGH PERFORMANCE FAÇADE IN TROPICAL CLIMATES

Introduction

Façade Treatment

High Performance Glass

Aluminium Coating

Study Case



What to look for in a façade design?

AESTHETICS

*Shape
Materials
Colour
Texture
Visual aspects*

PERFORMANCE

*Technology
Specification
Durability
Criteria
Performance*

High Performance Façade in Tropical Climates

Introduction

Design is more than visual appearance. Holistic -or complete- design consist of equal parts visual composition and performance.

High performance design is the application and careful balance of performance principals and the art of composition. It is the integration of physics and the science of materials. It requires a basic understanding of building and construction sequencing. It is in this intersection of science, art, materials and construction where design and technology, art, and science become architecture.

Beauty is more than skin deep.

Keith Boswell - SOM

HOLISTIC BALANCED DESIGN

AESTHETICS

PERFORMANCE



High Performance Façade in Tropical Climates

Introduction

**GOT
BALANCE?**

AESTHETICS

PERFORMANCE



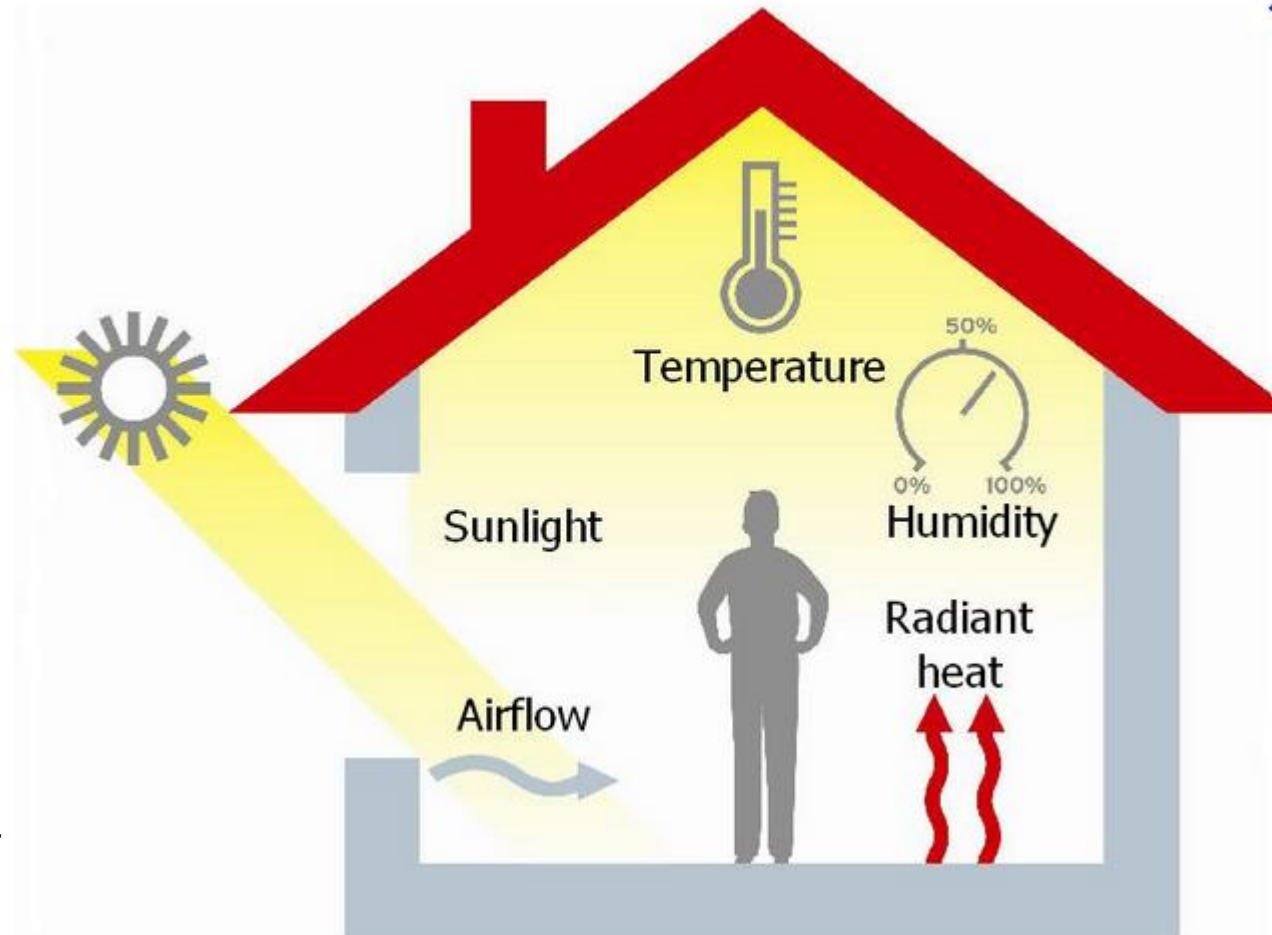
High Performance Façade in Tropical Climates

Introduction

Occupant Comfort

- ❑ Thermal
- ❑ Visual
- ❑ Acoustical
- ❑ Air Quality

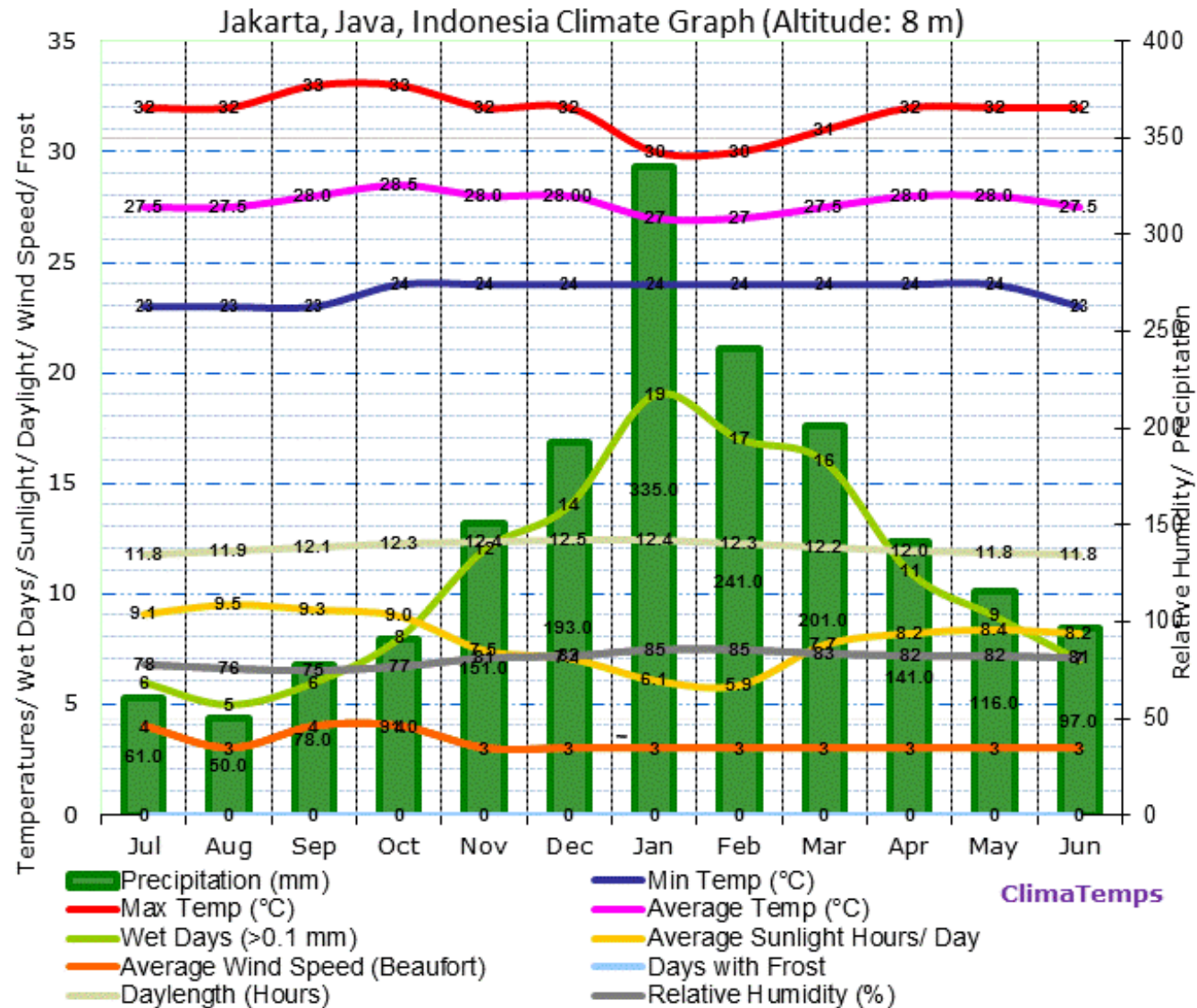
Build with A People-Centric Mindset





High Performance Façade in Tropical Climates

Introduction



Tropical Countries

(Indonesia) Characteristics

- Consistent Temperature and Warm (24°C - 33°C)
- Relatively Humid (75% - 85%)
- Abundant Sunlight (6.5 to 9.5 hrs per day)
- Low Wind Speed ($\pm 3\text{m/s}$)
- High Rainfall (50 to 135mm)

High Performance Façade in Tropical Climates

Introduction



High Performance Façade in Tropical Climates

Façade Treatment



**Is double skin façade
the optimum solution?**

High Performance Façade in Tropical Climates

Façade Treatment



- ❑ Sun Shading
- ❑ Large Overhang



High Performance Façade in Tropical Climates

Façade Treatment



South Quarter, Jakarta

Architect: Atkins

Façade:

Meinhardt Façade Technology



King Abdullah Univ, Saudi Arabia

Architect: HOK

Façade:

Meinhardt Façade Technology



High Performance Façade in Tropical Climates

Façade Treatment



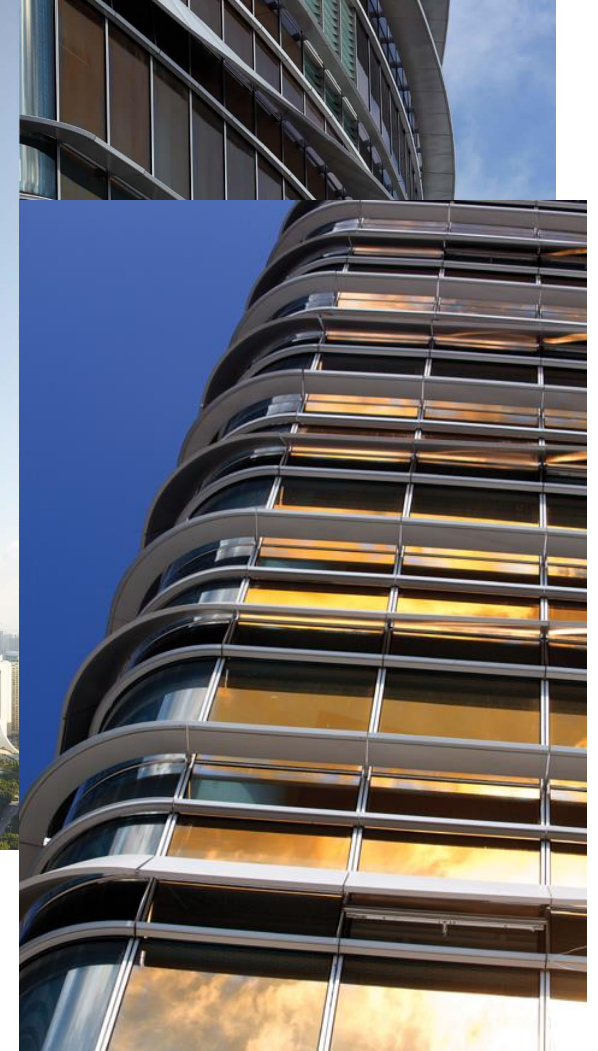
Raffles City, Hangzhou

Architect: UN Studio
Façade:
Meinhardt Façade Technology



Xiamen Fortune Centre

Architect: Aedas



High Performance Façade in Tropical Climates

Façade Treatment



Park Royal Hotel @Upper Pickering Street

Architect: WOHA
Façade : Meinhardt Façade Technology

High Performance Façade in Tropical Climates

Façade Treatment



Thamrin Nine, Jakarta

Architect: KPF; PAI and Airmas Asri
Façade : Meinhardt Façade Technology



High Performance Façade in Tropical Climates

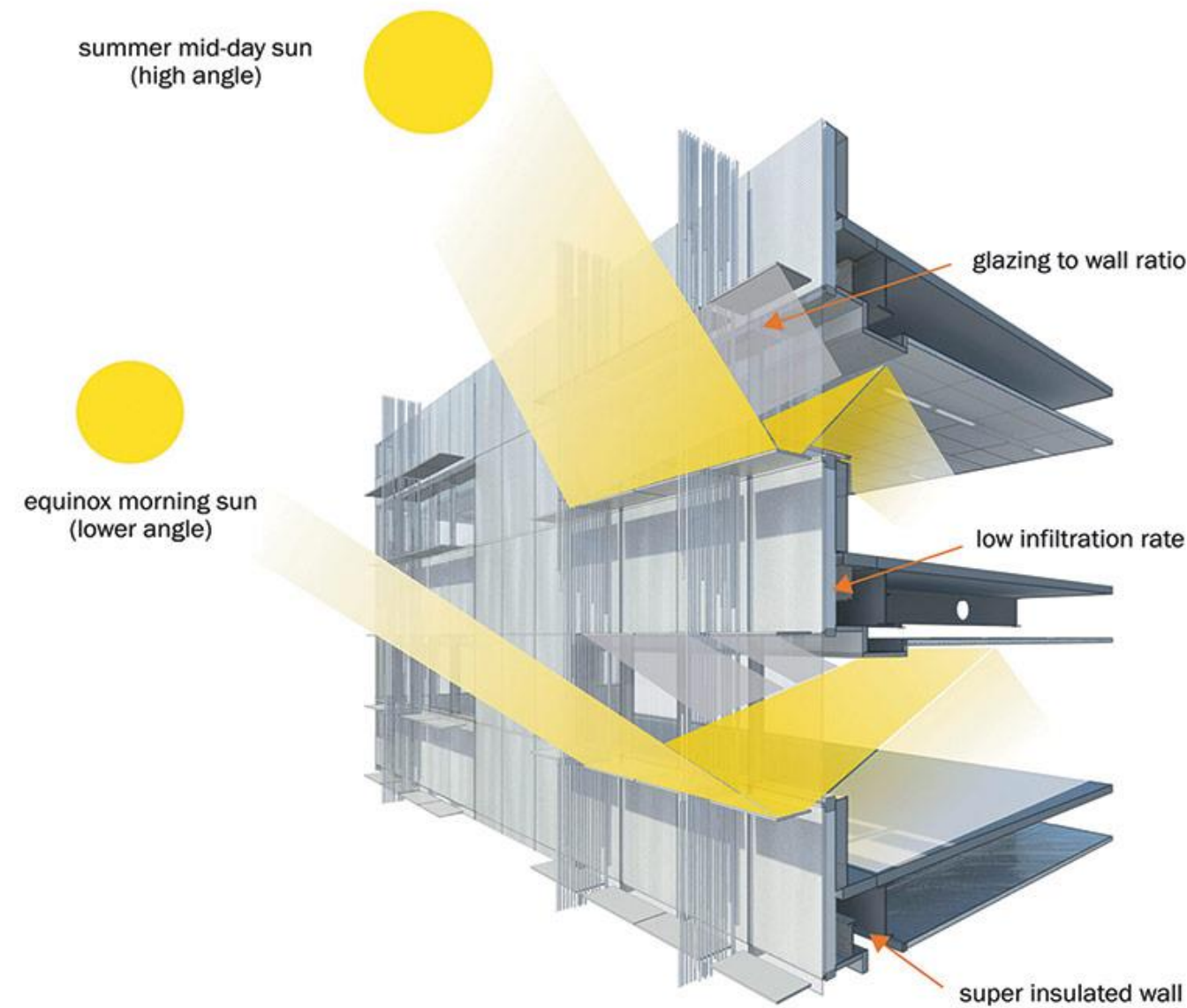
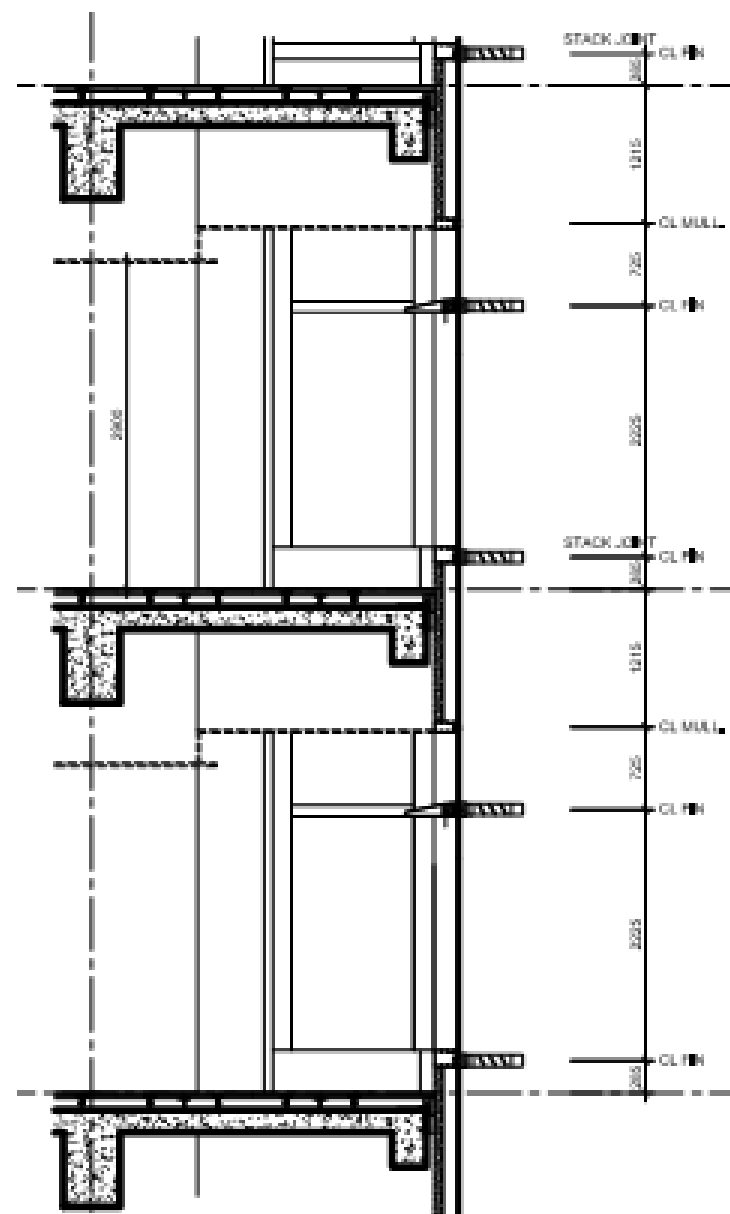
Façade Treatment



Daylight Section

High Performance Façade in Tropical Climates

Façade Treatment



High Performance Façade in Tropical Climates

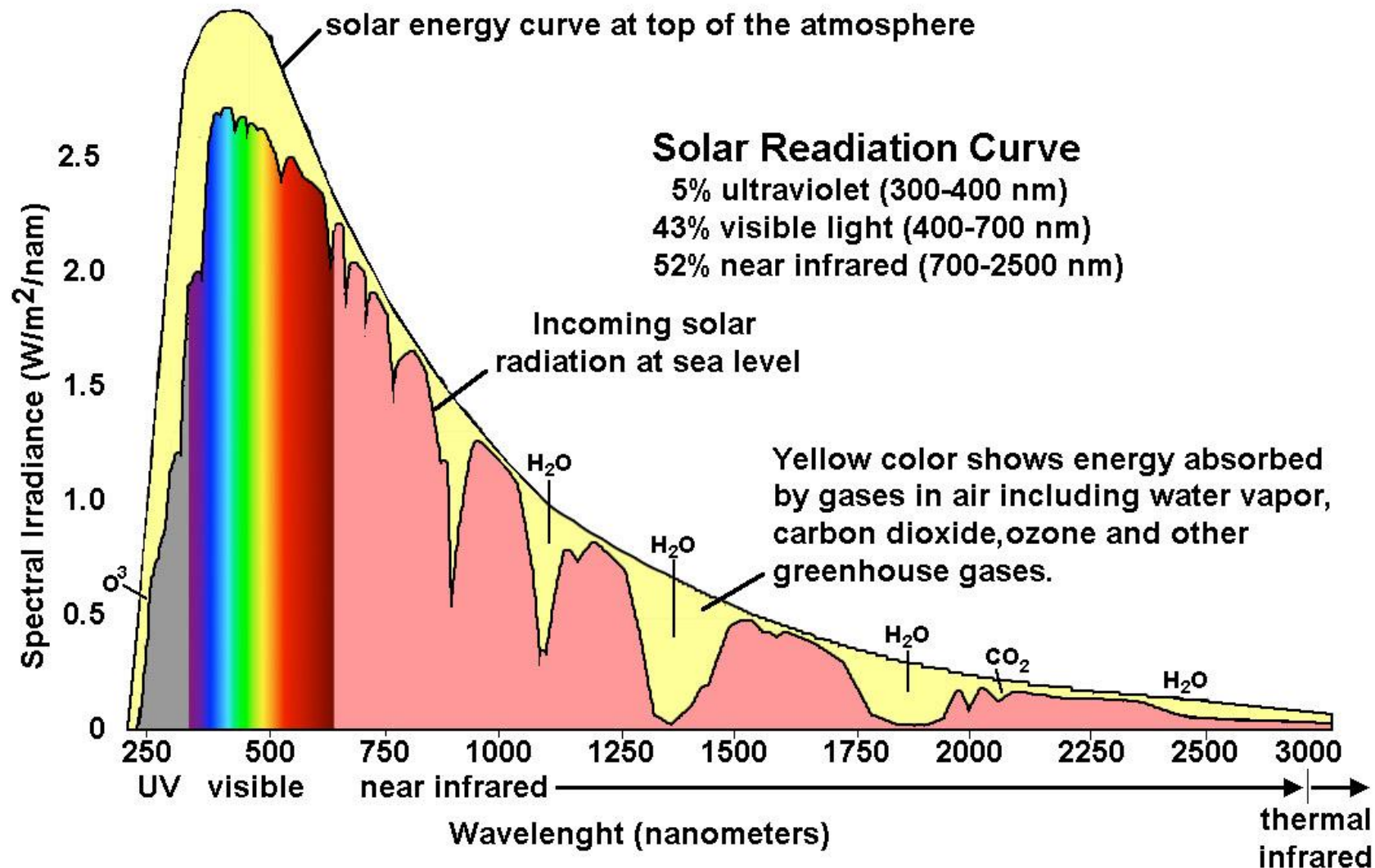
High Performance Glass



High Performance Façade in Tropical Climates

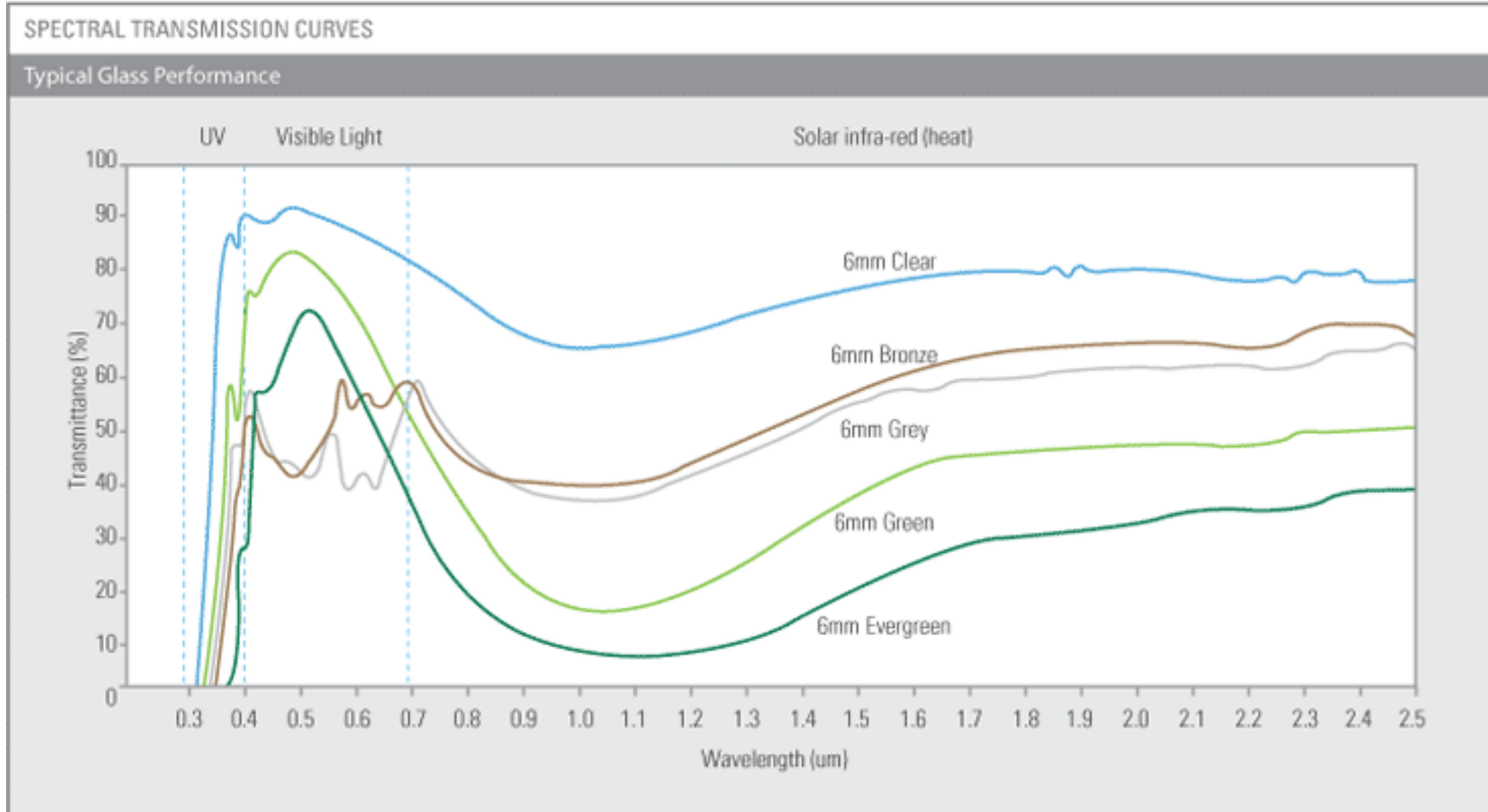
Sunlight Radiation Spectrum

Solar Energy Distribution



High Performance Façade in Tropical Climates

High Performance Glass

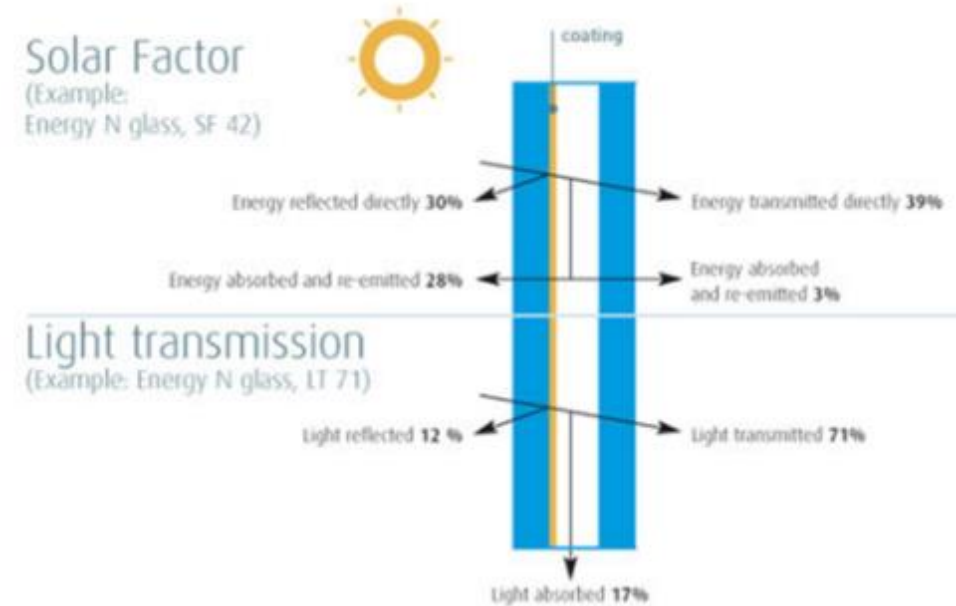


High Performance Façade in Tropical Climates

High Performance Glass

GLASS PERFORMANCE DATA:

- SC (Shading Coefficient)
- U-VALUE
- ILR (Internal Lighting Reflectance)
- ELR (External Lighting Reflectance)
- VLT (Visible Lighting Transmittance)



Good Heat Performance Façade Material

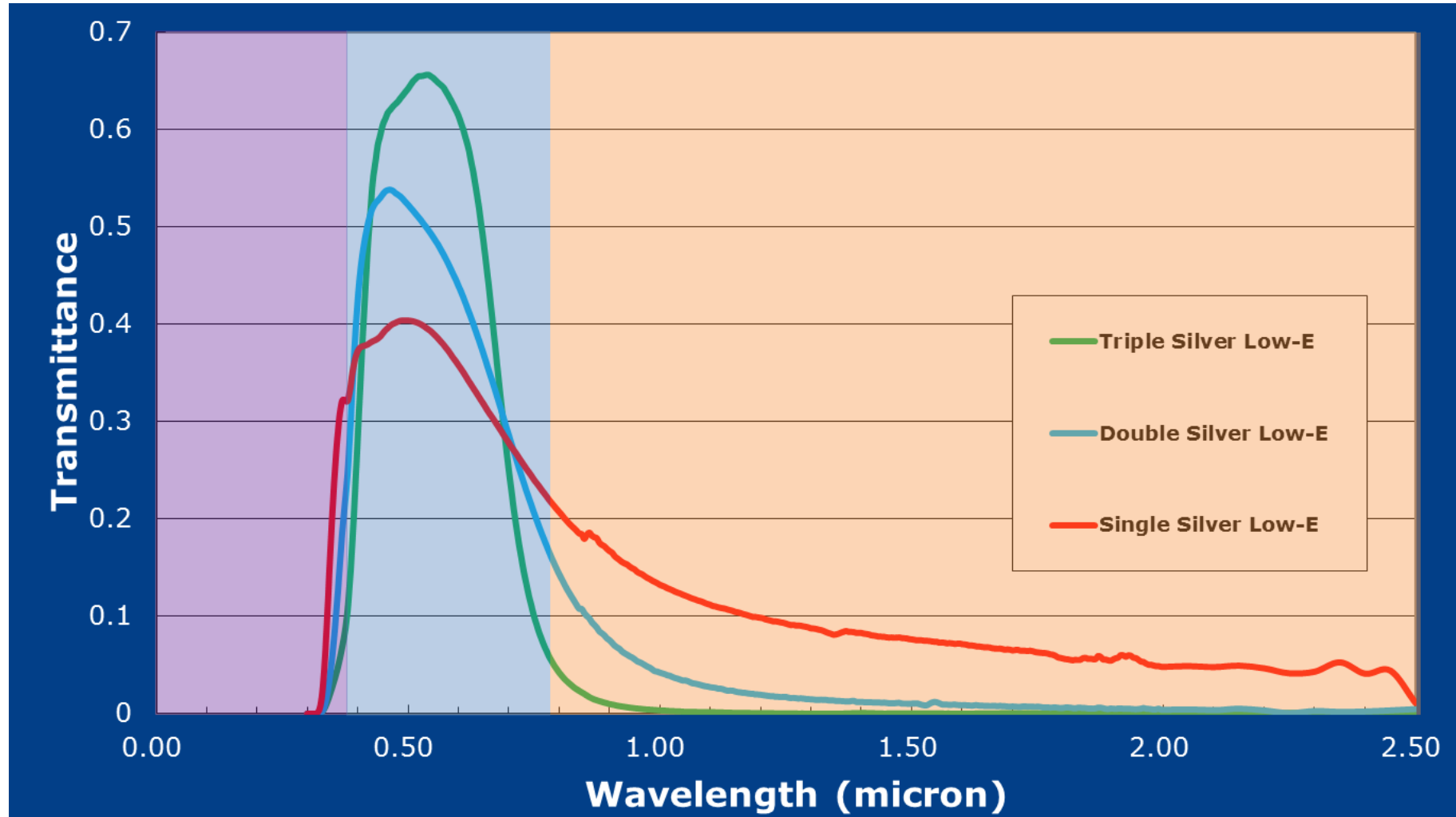
- Low **SC**
- Low **U-Value**
- Adequate **Light Transmittance**
- Low **Reflectivity**

Visible Transmittance **VS** *Thermal Performance*
Light Reflectivity



High Performance Façade in Tropical Climates

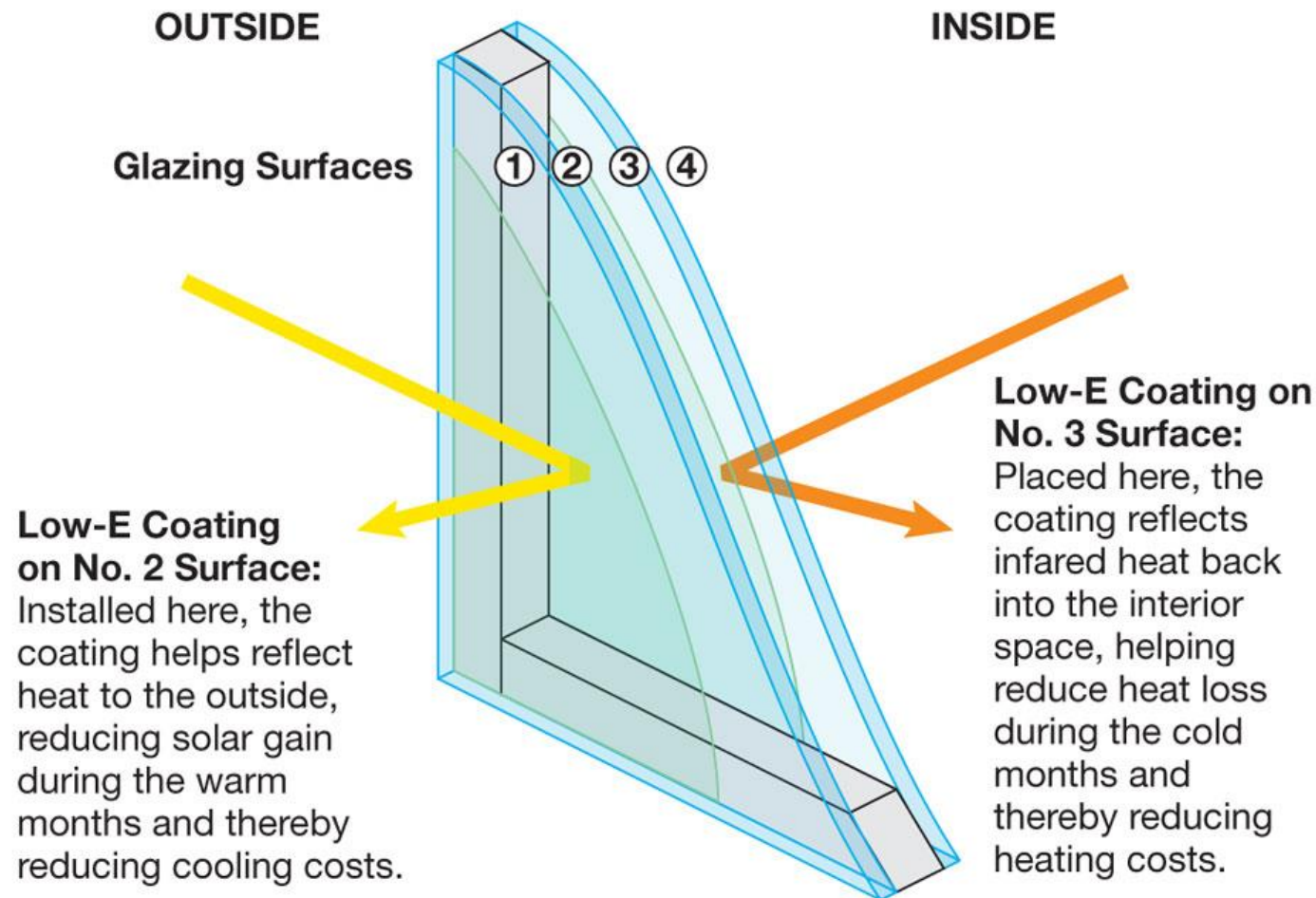
High Performance Glass



High Performance Façade in Tropical Climates

High Performance Glass

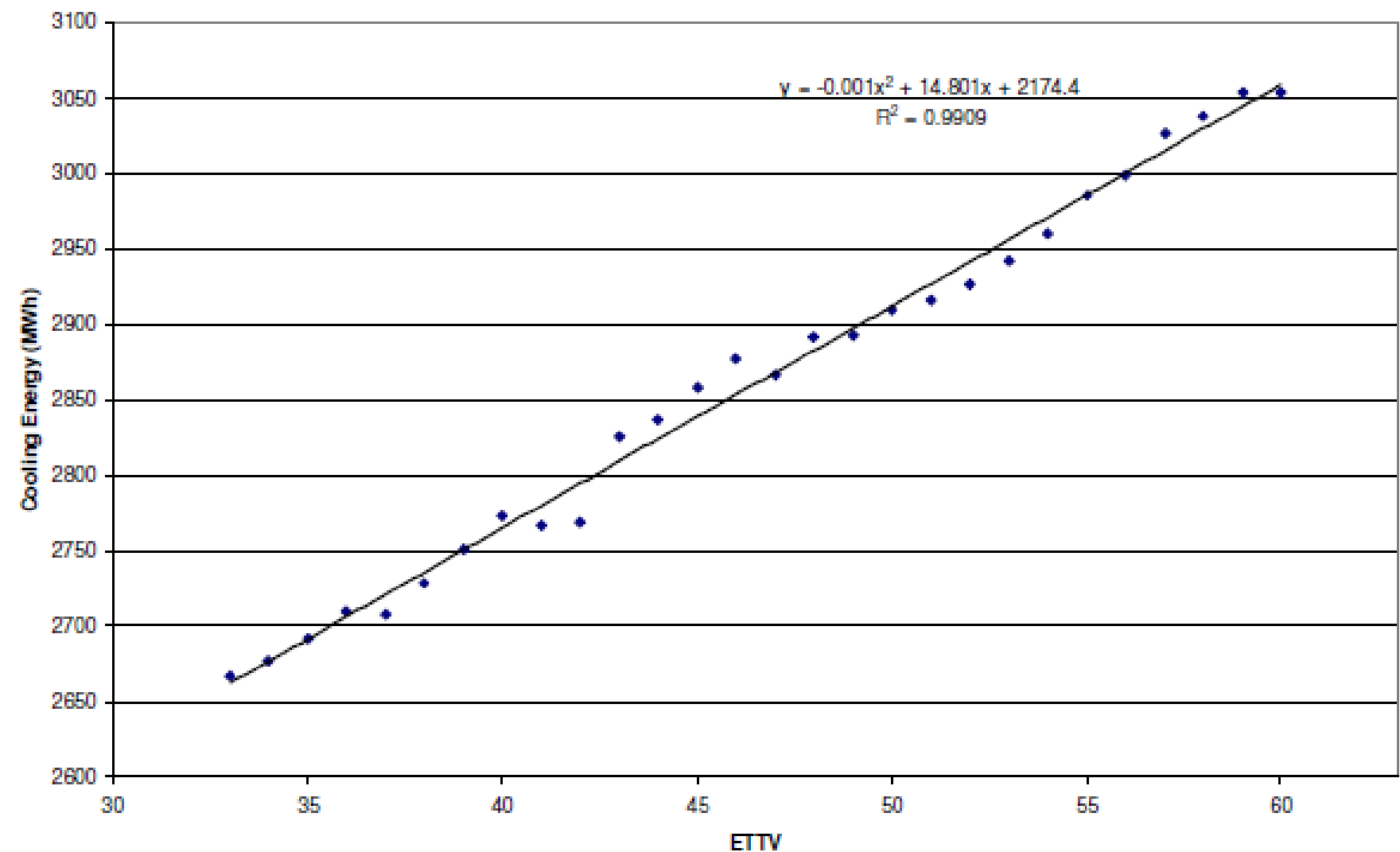
Low-E Coatings & Performance



High Performance Façade in Tropical Climates

High Performance Glass

Cooling Energy vs ETTV



High Performance Façade in Tropical Climates

Case Study – WTC 2 Project



Architect: Aedas and PTI
Façade:
Meinhardt Façade Technology

Glass make-up:

DGU

8mm Clear HS Glass with Low-e coating +
12mm AS (Argon) + 6mm Clear HS Glass

Glass Performance:

- SC: 0.22
- U-Value: $1.4\text{W/m}^2\text{°K}$
- VLT: 35%
- ELR: 22%
- ILR: 15%

Coating:

External: PVDF (3 coats 1 bake) – AAMA 2605

Internal: Powder Coating – Qualicoat Class 3

MEINHARDT

High Performance Façade in Tropical Climates

Case Study – IFC 2 Project



Glass make-up:

DGU

10mm Clear HS Gl's with Low-e coating (Triple Low-e) + 12mm AS + 8mm Clear HS Gl's

Glass Performance:

- SC: 0.23
- U-Value: 1.40W/m²°K
- VLT: 41%
- ELR: 26%
- ILR: 22%

Coating:

External: PVDF (3 coats 1 bake) – AAMA 2605

Internal: Powder Coating – Qualicoat Class 2

High Performance Façade in Tropical Climates

Case Study – Thamrin Nine Project



Glass make-up:

DGU

8mm Clear HS Glass with Low-e coating +
12mm AS + 8mm Clear HS Glass

Glass Performance:

- SC: 0.24
- U-Value: 1.7W/m²°K
- VLT: 31%
- ELR: 25%
- ILR: 10%

Coating:

External: PVDF (3 coats 1 bake) – AAMA 2605

Internal: Powder Coating – Qualicoat Class 2

High Performance Façade in Tropical Climates

Case Study – Avian Office Project



Glass make-up:

DGU

8mm Clear HS Glass with Low-e coating +
12mm AS + 6mm Clear HS Glass

Glass Performance:

- SC: 0.27
- U-Value: 1.60W/m²°K
- VLT: 31%
- ELR: 29%
- ILR: 14%

Coating:

External and Internal:

Powder Coating – Qualicoat Class 2

Architect: Archimetric, Surabaya
Façade:
Meinhardt Façade Technology

HAVE YOU FOUND BALANCE
IN YOUR PROJECT?



Timothy SOEBROTO
Associate Director
Meinhardt Façade Technology
timothy.s@mfacade.com



Thank You

Copyright © Meinhardt Group 2017. All rights reserved. No part of this publication may be reproduced by any means, whether graphically, electronically, mechanically or otherwise howsoever, including without limitation photocopying and recording on magnetic tape, or included in any information store and/or retrieval system without prior permission of Meinhardt Group.

