# Integrating PV and dynamic glass - A high-rise façade retrofit

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# BIFF FACADE CONSULTANT

## Swiss global specialist for façade envelopes

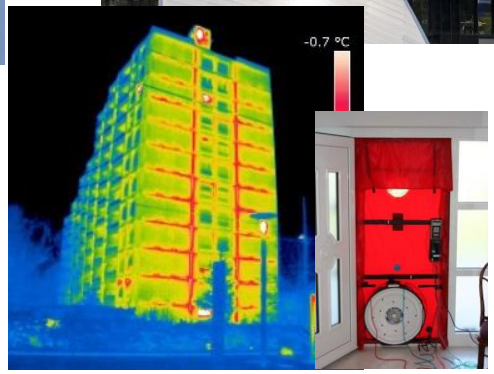
**New construction & refurbishment complex projects.**

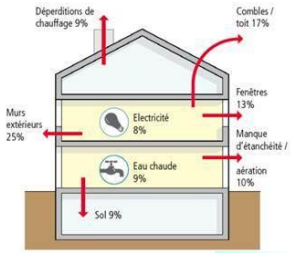
- TECHNICAL ANALYSIS:
- Engineering and technical design development for bespoke façade projects.

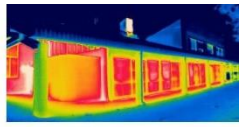
- BUILDING PHYSICS:
- Studies and analyses of existing buildings achieving tailored sanitation solutions

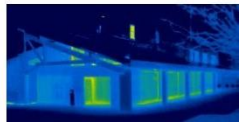
- WORKS SUPERVISION:
- Project management and prototype supervision with special attention to programme and cost

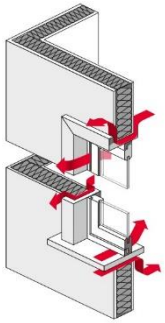
- EXPERTISE
- Determinate faults, seek out their cause, suggest remedies and budgeting cost repair. Address responsibility.

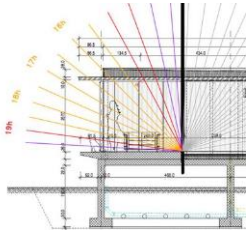


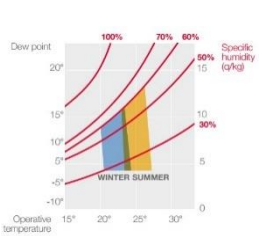









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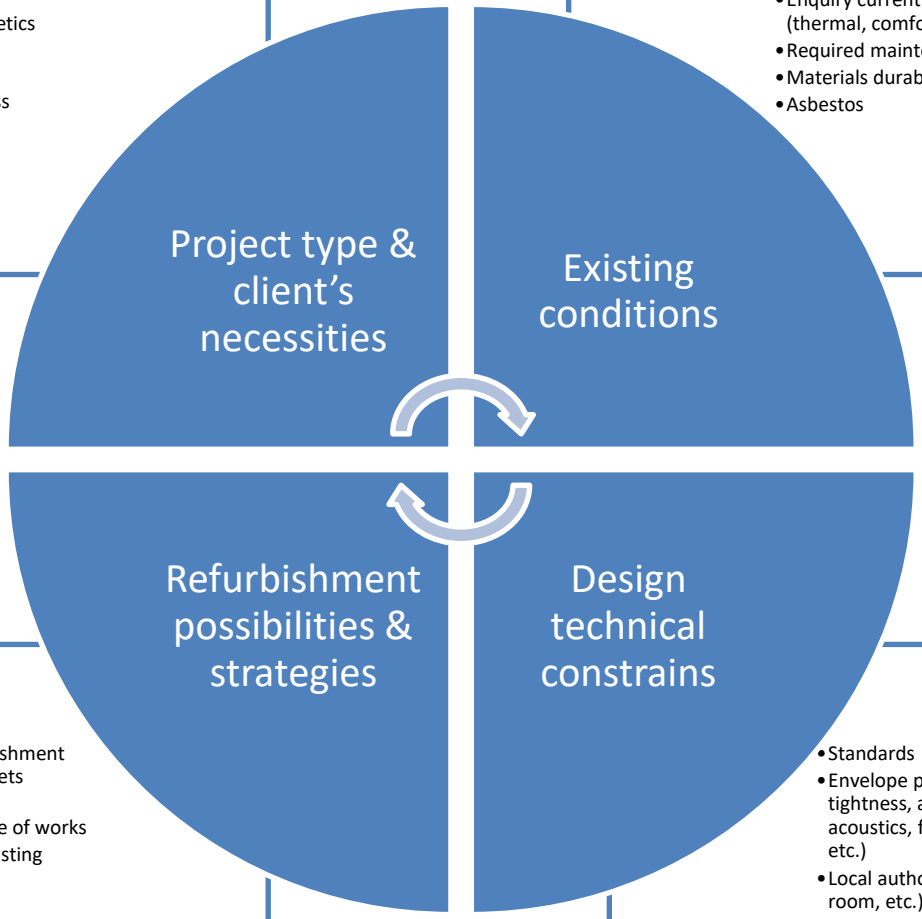
# Analyze refurbishment possibilities & possible Energy-efficient solutions




- Total or partial refurbishment
- Envelope performance improvement and aesthetics objectives
- Client's strategic goals
- Clients budget awareness

- Determine faults
- Enquiry current users about main issues (thermal, comfort, water leaks, etc.)
- Required maintenance and costs
- Materials durability, life expectancy
- Asbestos

- Present different refurbishment options along with budgets estimations
- Building up a programme of works
- Take advantage of all existing elements

- Standards
- Envelope performance (thermal, light, water tightness, air permeability, resistance, acoustics, fire, security, building movements, etc.)
- Local authorities (aesthetics, performance, room, etc.)
- Site conditions (access, plant, etc.)

Envelope audit

Technical concept study

Ensure Clients necessities accomplished

Present several possibilities and budgets

# PPN Tour Firmenich
# Refurbishment project

External blinds to be replaced
Very low thermal performance
End of expected life
Comfort issues
Aesthetics

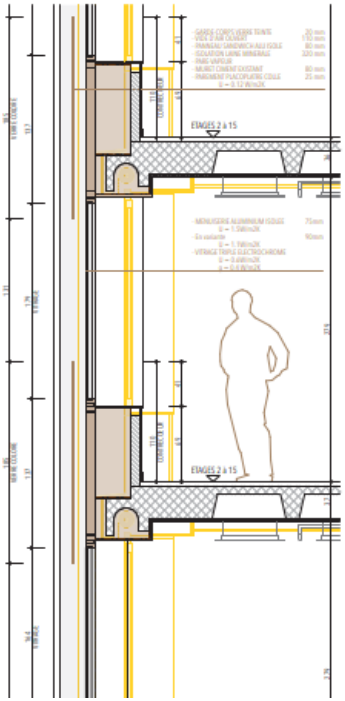
Necessity of new façades

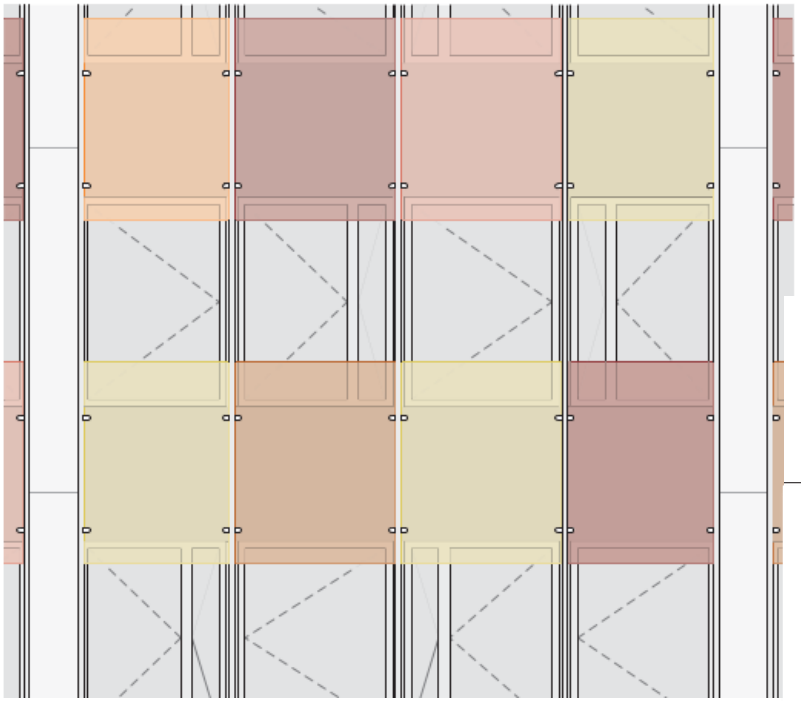
# PPN Tour Firmenich
# Competition

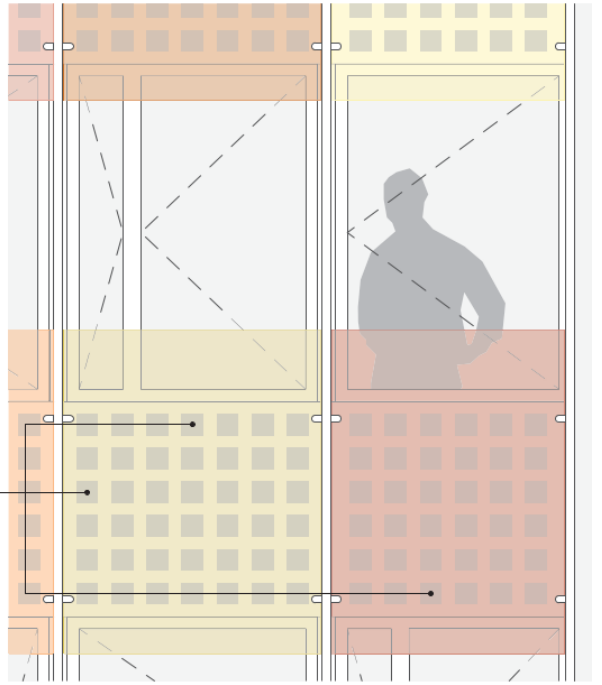
Comfort optimisation
Thermal performance – surface ratio
Dynamic glass
PV parapets

Minimise maintenance

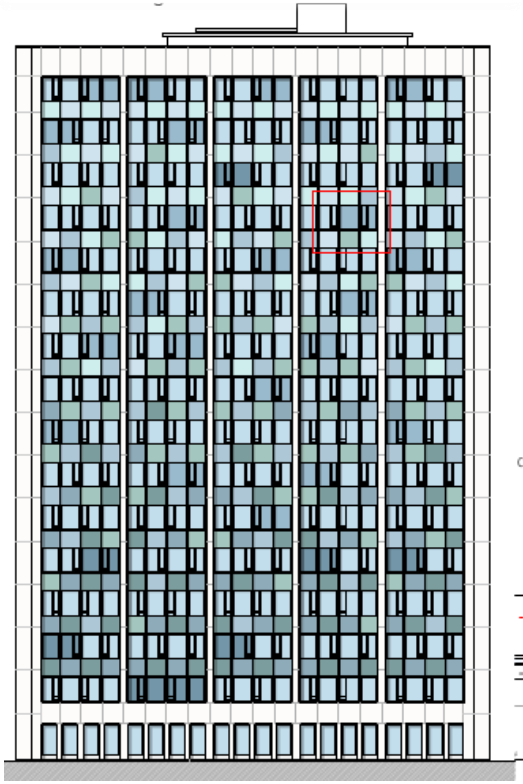
# PPN Tour Firmenich
# Competition

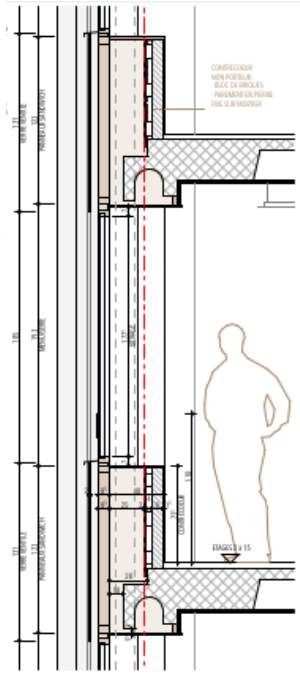




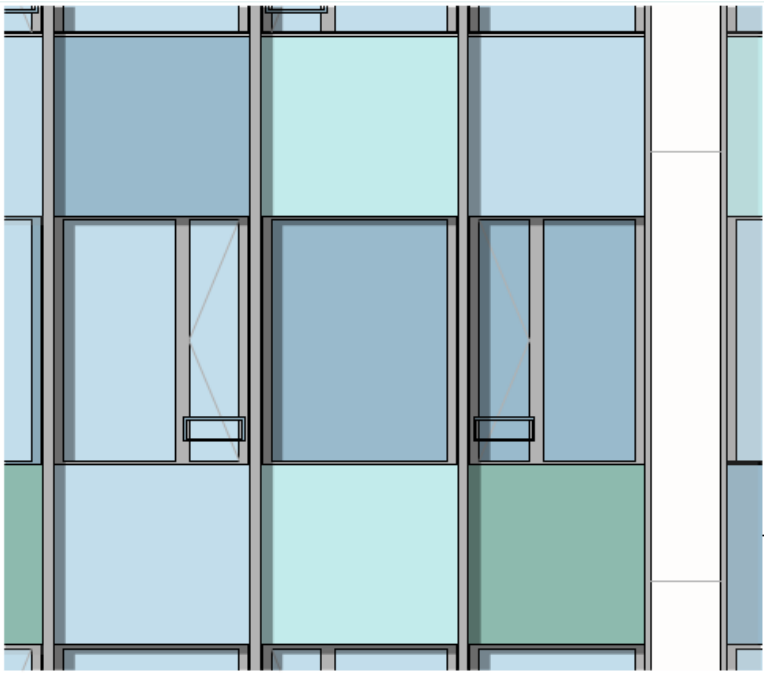


# PPN Tour Firmenich
# Project proposal

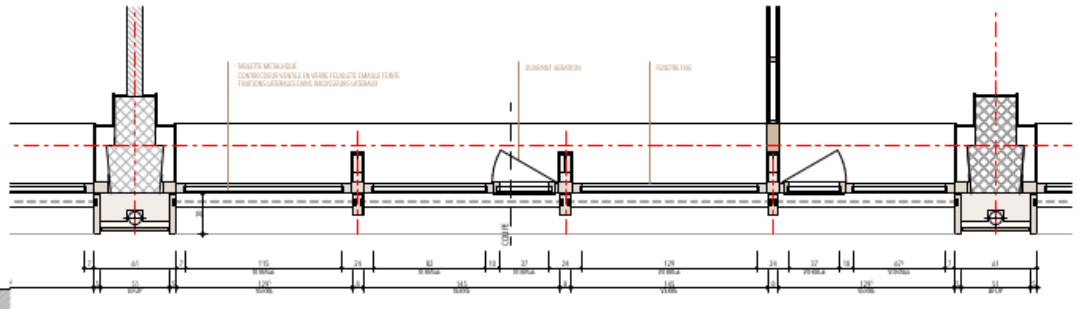




COUPE TRANSVERSALE - PROJET



FACADE SUD-EST - PROJET



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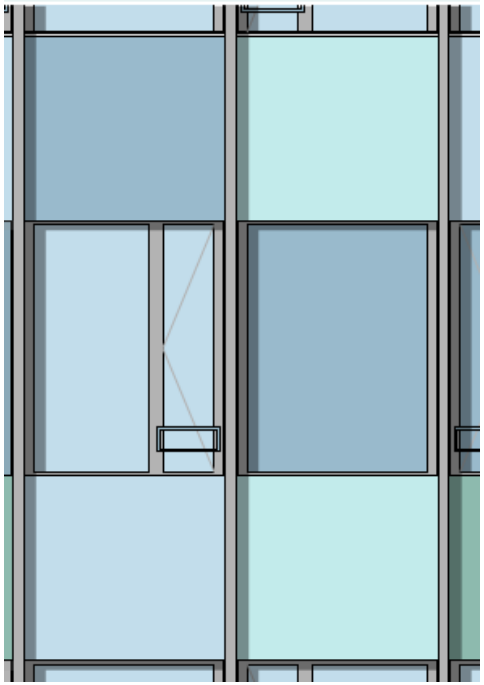


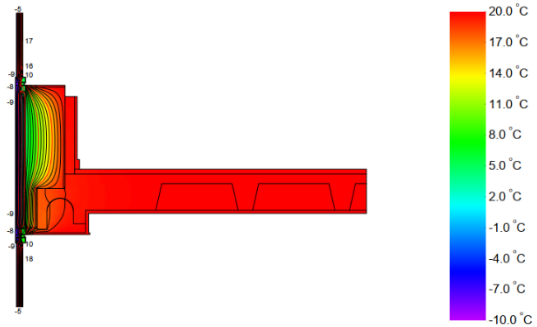


TECHNICAL SPECIFICATIONS

| | | Clear | Intermediate 1 | Intermediate 2 | Dark |
|---|---|---|---|---|---|
| External colour | In reflexion | neutral | neutral | neutral | neutral |
| Internal colour | In transmittance | neutral | light green | green | green |
| Light factors | light transmission | 43% | 18% | 6% | 1% |
| EN 410 | RL ext | 10% | 5% | 5% | 5% |
| D65 2° | RL int | 17% | 16% | 16% | 16% |
| UV | Transmission uv | 0% | 0% | 0% | 0% |
| | Solar factor g | 0.21 | 0.10 | 0.05 | 0.03 |
| EN 673 | U value, 90% Krypton | 0.6 W/(m²·K) | | | |

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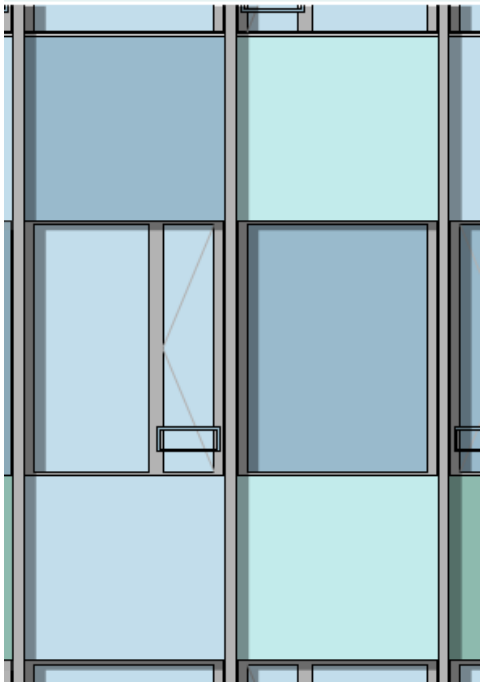


**Color Blast Kameleon Solar**

- 290 panels type A 1300 x 1450 mm
- 290 panels type B 1300 x 1450 mm
- 1050 m2
- **Power about 120,000 Wc**

# PPN Tour Firmenich
# Research Electrochromic

**Electrochrome:**
- Sageglass Harmony
- Sageglass Lightzone
- Halio

**Thermochrome**
- SECM

**Standard:**
- Standard glazing
- External blinds

**Controlled values:**
- Light transmission
- Transition speed
- Light spectrum
- Colour temperature
- Surface temperature
- Internal temperature
- Visual comfort
- Real users

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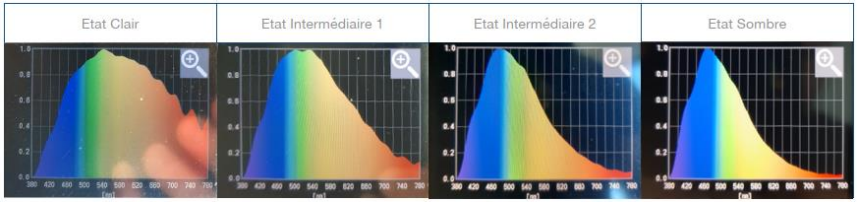
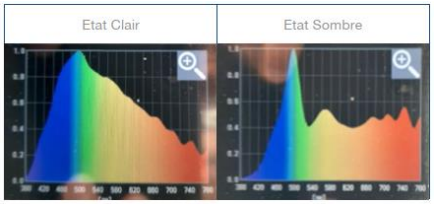
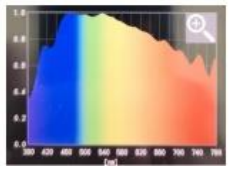
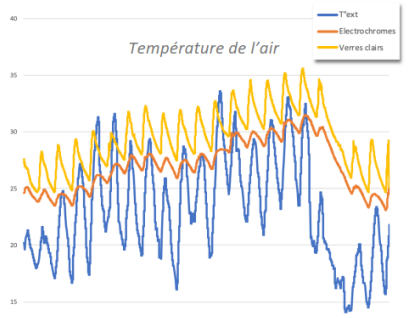
# Research Electrochromic



| Températures (°C) | A | B | C | D | E | Store Lames 100% fermés | Store Lames Horizontales | Vitrage Nord |
|---|---|---|---|---|---|---|---|---|
| Teinte Claire | 33.5 | 33.2 | 33.1 | | 33.9 | 33.9 | 30.9 | 24.4 |
| Teinte Sombre | 30.9 | 30.8 | 31.4 | 32.2 | | | | |

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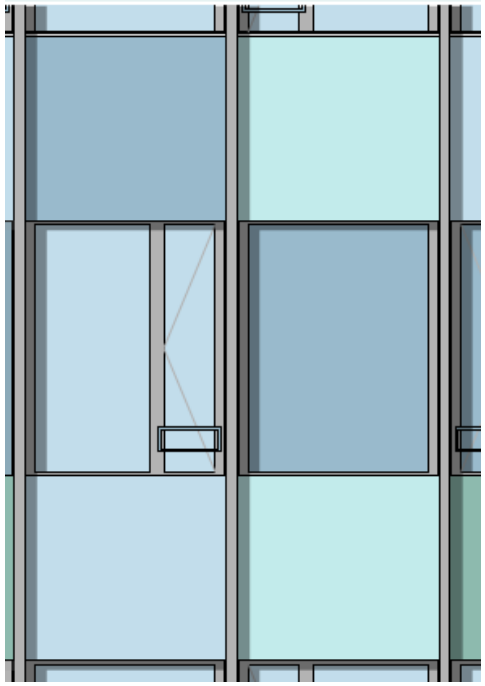
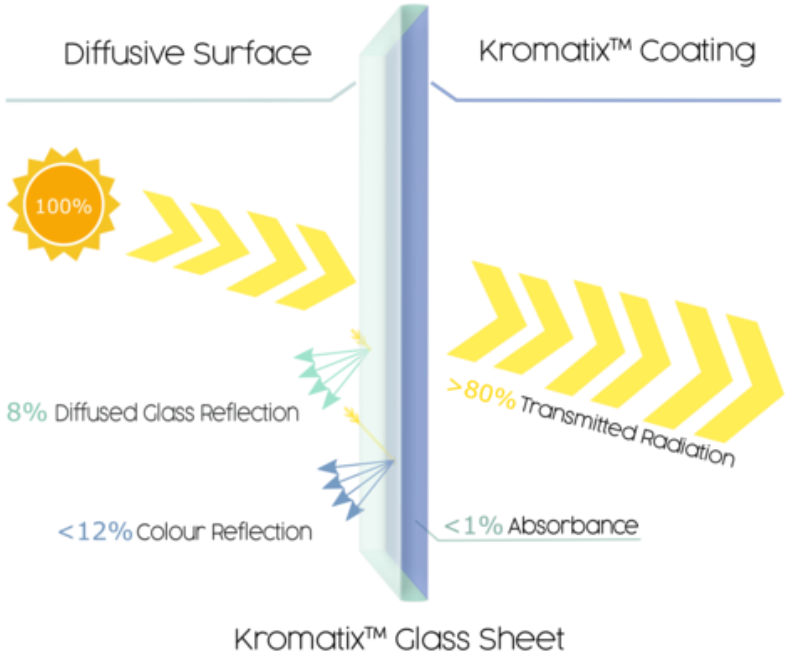
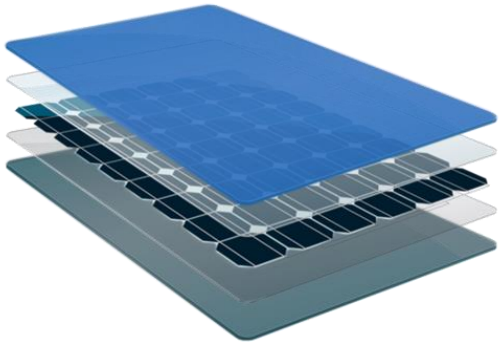
# Research PV solutions



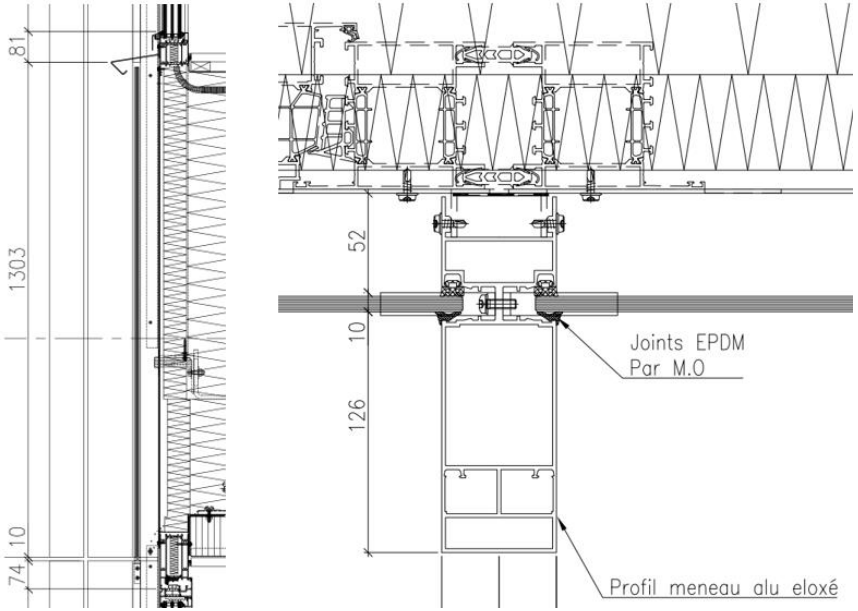


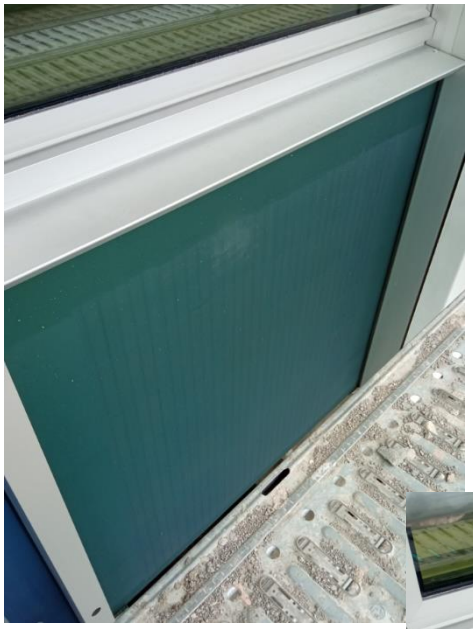

**Solarwall Panels with Kromatix™ coloured solar glass**

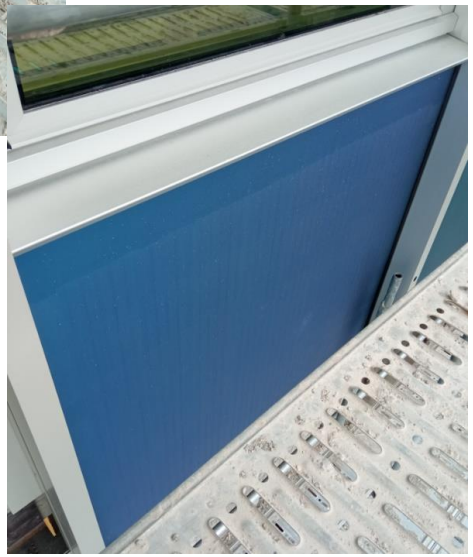
- 290 panels type A 1300 x 1300 mm
- 290 panels type B 1300 x 1490 mm
- 1050 m2
- **Power about 150 kWc**

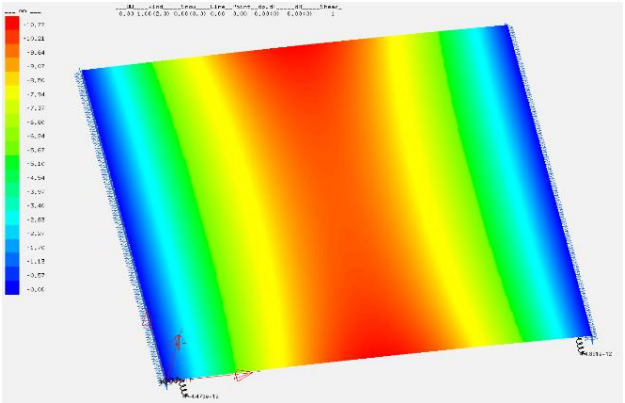


# PPN Tour Firmenich
# Integrating PV solution

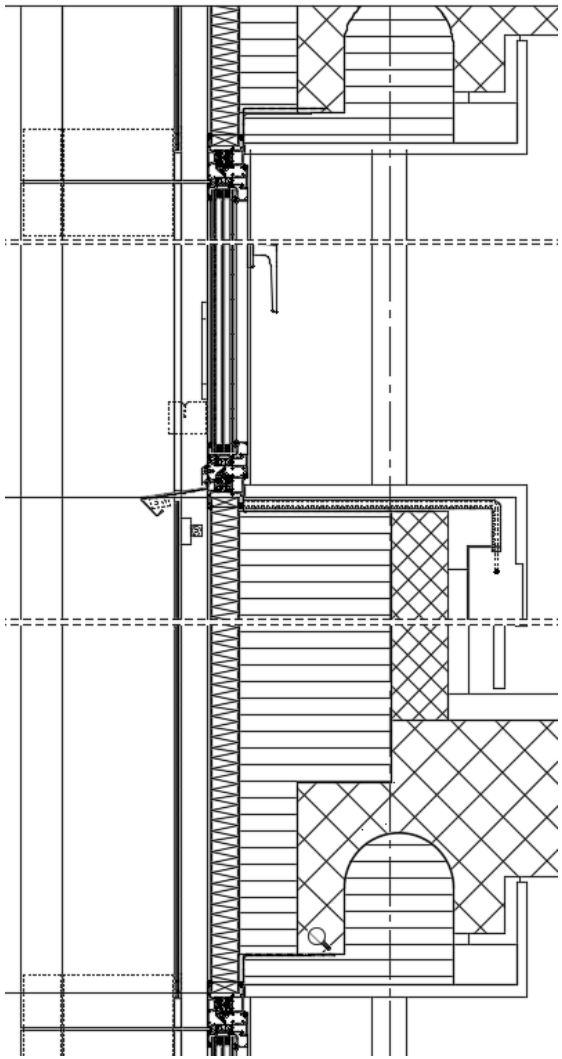


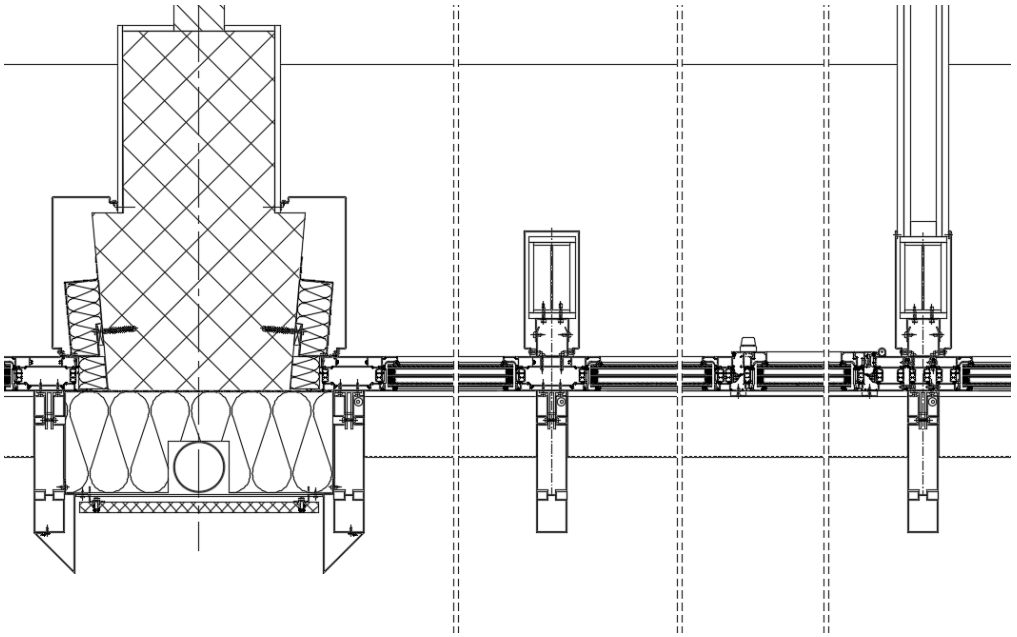







# PPN Tour Firmenich
# Design update





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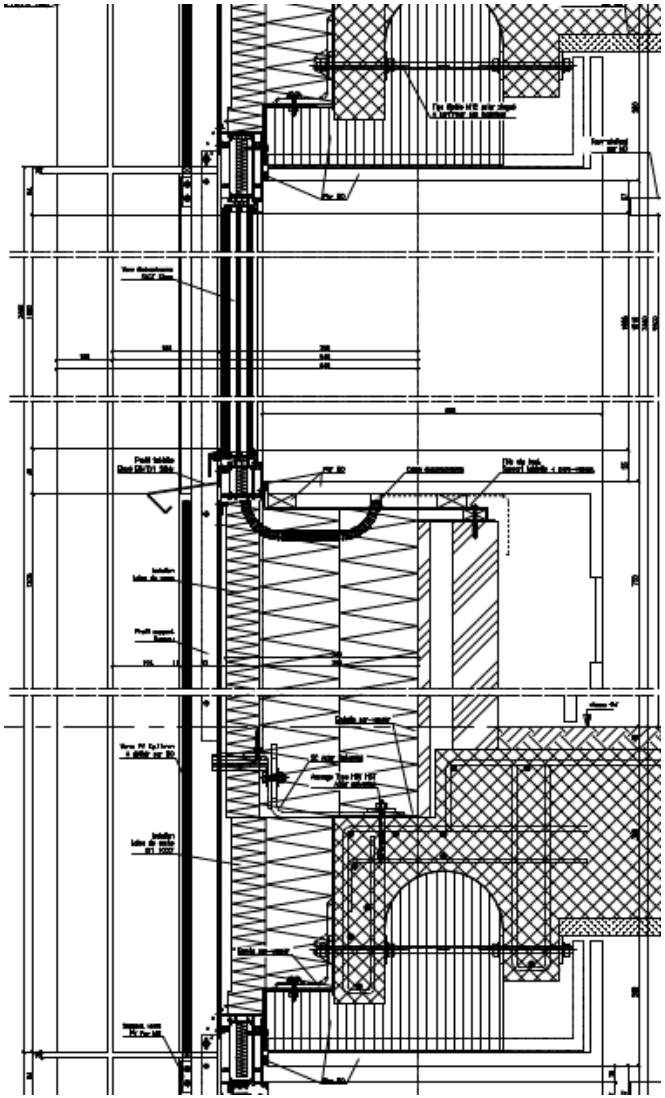
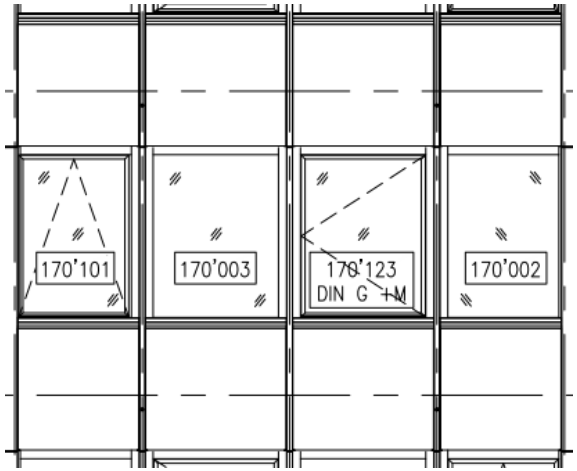
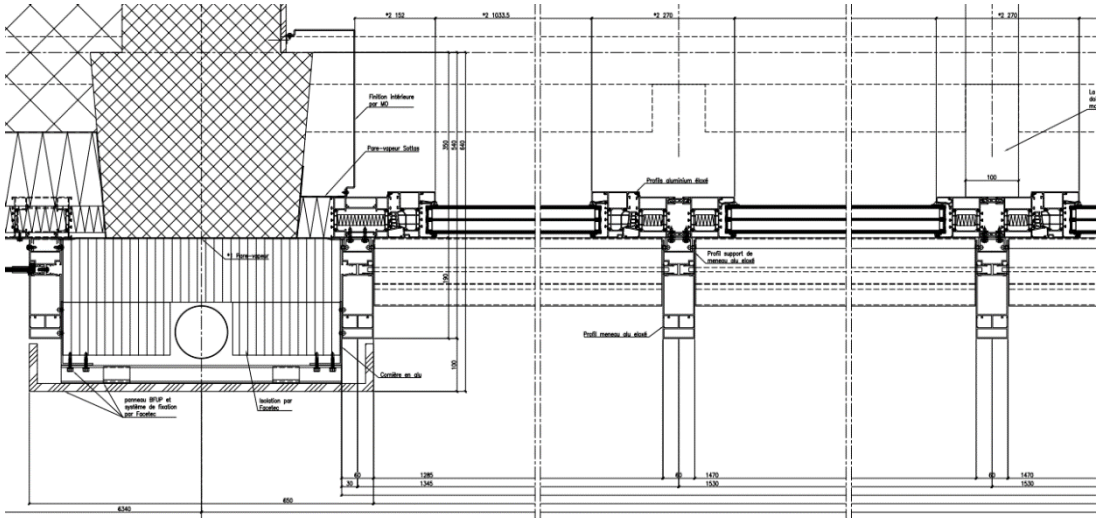
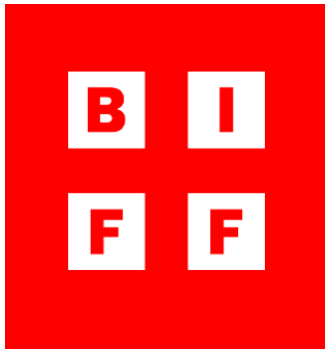




# Double skin thin façade
## Fire & Thermal performance

THANK YOU - QUESTIONS?

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