



ACTIVIDADES | TESTES, ENSAIOS E CERTIFICAÇÃO

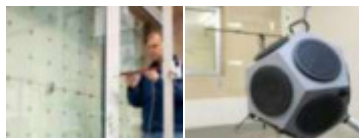


REYNAERS CAMPUS:

- Certificação, teste e aprovação técnica das soluções
- Um dos maiores laboratórios privados de ensaio de caixilharia



CONFORTO



Testes
ar água vento

Testes
térmicos e
acústicos



SUSTENTABILIDADE



Testes de
ciclos e fadiga

Testes de
corrosão



SEGURANÇA



Testes de
resistência à
intrusão

Testes de
impacto e
mecânicos



Experience center: NZEB

Campus development:

- + Electric charging stations
- + Rainwater recuperation
- + Considerate landscaping with local plant species
- + Running track
- + Beehive
- + ...



SUSTAINABILITY @ REYNAERS | Energy



	Reynasol I	Reynasol II
Surface roof	16.000 m ²	28.000m ²
Surface PV panels	5.000 m ²	11.000m ²
Yearly production	500.000 kWh	1.400 .000 kWh

83% of the necessary energy per year

SUSTAINABILITY @ REYNAERS | Transport



Making sustainable transport possible

- analyzing and optimizing transport routes of the trucks
- reducing transport as far as possible by eg. local sourcing



SUSTAINABILITY @ REYNAERS | Transport



Making sustainable commute possible

- Encouraging bicycle use:
 - <15 km: bicycle
 - >15 km: electrical bicycle
 - Commuters by train: folding bicycle



- Supporting carpooling:
 - Park at reserved parking lots nearby the entrance
 - After 20 carpool travels: carwash voucher



SUSTAINABILITY @ REYNAERS | Material use



Consciously using and/or recycling of materials

- **ISO 14001:** certified environmental management system



- **Waste management:** reducing and sorting waste, reducing packaging materials, ...
- **Office management:** double sided printing, FSC paper, ...





REYNAERS | SISTEMAS EM ALUMÍNIO PARA ARQUITETURA

Alumínio:

metal mais abundante na crosta terrestre, 100% reciclável

Soluções sustentáveis e ecológicas com diversas certificações



GAMA REYNAERS | EDIFÍCIOS LOW ENERGY | PASSIVE HOUSE



SOMBREAMENTO BS 100



CORRER CP 155 HI



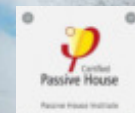
PORTAS | JANELAS SL 38 HI

MASTERLINE 8
Criação para grandes

- 1 Estilos
Funcional, seco, Amizabilidade, Hóspedes, Interiores
- 2 Isolamentos térmicos
Uf = 1,2 W/m²K
- 3 Flúvel e robusto
Até 2000 kg por folha / 20.000 ciclos
- 4 Placas móveis
Folhas com 2,8 m de altura

MASTERLINE 10
Sem compromissos

- 1 Isolamento acústico absoluto
Rw = 45-45 (10-4)
- 2 Eficiência energética máxima
Uf = 0,9 W/m²K
- 3 Resistência mecânica superior
Até 300 kg por folha / 20.000 ciclos
- 4 Elevada Segurança
RC2 / RC3



SUSTAINABLE PRODUCTS | Thermal performance



Stimulating energy-efficient building by improving energy performance of our products



- **CS 86 HI:** +/- Uf 1.5 W/m²K
- **MasterLine 8 HI:** +/- Uf 1.2 W/m²K
- **CS 104:** +/- Uf 1.0 W/m²K
- **CP 155 HI-Minergie:** +/- Uf 2 W/m²K
- **CW 50 HI:** +/- Uf 0.9 W/m²K



MINERGIE®




MINERGIE®



SUSTAINABLE PRODUCTS | Airtightness

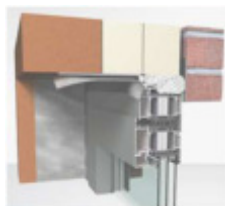


Stimulating energy-efficient building by improving energy performance of our products



Reynaconnect - solution for building connections:

- Airtight
- Simple installation
- Acoustic insulation
- Thermal insulation
- Damp regulation
- Watertight



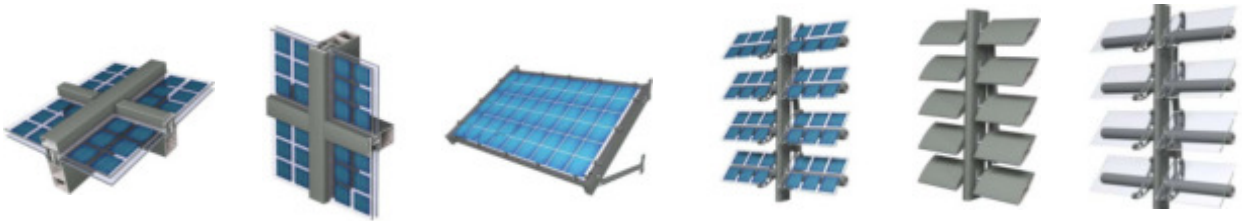
SUSTAINABLE PRODUCTS | Solar energy



Stimulating energy-efficient building by improving energy performance of our products



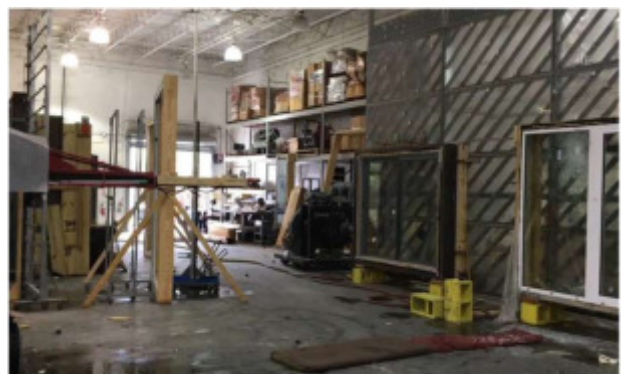
- **CW 60 solar:** BIPV
- **BS solar**
- **BS 100:** sun shading



SUSTAINABLE PRODUCTS | Comfort & safety



Stimulating comfortable and safe building



SUSTAINABLE PRODUCTS | Labels

Reynaers Aluminium

TYPES OF ENVIRONMENTAL LABELS:

ISO14020 labels

Type I
They say my product is environmentally performant.
 ISO 14024

Type II
I say my product is environmentally performant.
 ISO 14021

Type III
 Here are my results.
 It is up to **You** to judge.
 ISO 14025

SUSTAINABLE PRODUCTS | EPD

Reynaers Aluminium

ENVIRONMENTAL PRODUCT DECLARATION (EPD):

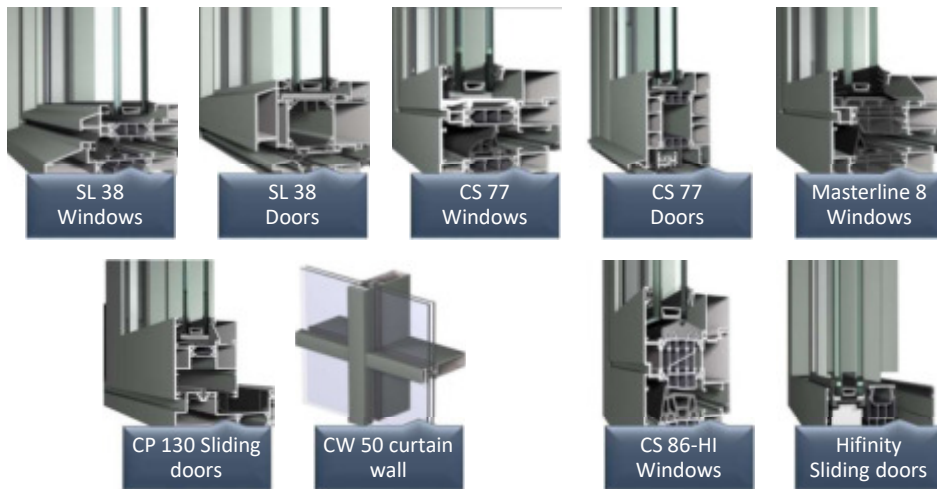
A **verified** document that reports **environmental impact data** of products based on **life cycle assessment (LCA)** in accordance with the international standard ISO 14025.

Requirements:

- LCA assessment (EN 15804)
- Independent verification



REYNAERS EPD:



Requirements:

- Assessment of substances based on
 - Bill of Materials
 - Material Safety Data Sheets
 - EPD (optional)
 - Life cycle
- Classification A to D based on
 - Chemical composition
 - Health impact
 - Environmental impact
 - VOC
 - ...

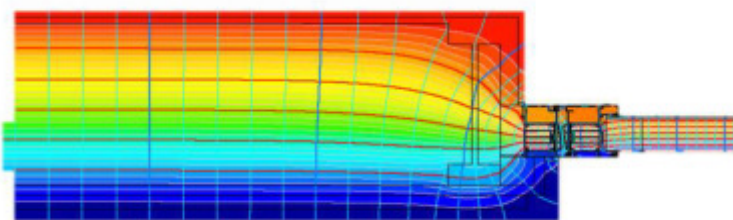
Product	Brand	Ass./Ref.	CM	EL	Assessment
CS77 Fönster och dörrar	Reynaers Aluminium	2016-10-01	A	RE	RE
Karafa Coolmax	Reynaers Aluminium	2016-10-01	B		RE
GG70	Reynaers Aluminium	2016-10-01	B		RE
CS11 SS-SC	Reynaers Aluminium	2016-10-05	B	UR	RE
CS11 SS-CS	Reynaers Aluminium	2016-10-05	B	UR	RE
CS11 SS-EF CS	Reynaers Aluminium	2016-10-05	B	UR	RE
CS11 SS-H	Reynaers Aluminium	2016-10-01	B	UR	RE
CS80	Reynaers Aluminium	2016-10-01	C	RE	RE
CPS Superfast	Reynaers Aluminium	2016-10-01	C		RE
Reynalish RD	Reynaers Aluminium	2016-10-01	C		RE
Zement Black	Reynaers Aluminium	2016-10-01	C	R	RE
Reynal Duo komponent B	Reynaers Aluminium	2016-10-01	C	R	RE
CS11 SS-PP	Reynaers Aluminium	2016-10-01	C	UR	RE
Karafa Fixholm 100	Reynaers Aluminium	2016-10-01	D		
Reynal Duo komponent A	Reynaers Aluminium	2016-10-01	D		
Silvix 2	Reynaers Aluminium	2016-10-01	D		
City-Band ABSZW	Reynaers Aluminium	2016-10-01	D		
AT102 Aluminiumföreg	Reynaers Aluminium	2016-10-01	D		

Requirements:

- U_d installed ≤ 0.8 W/(m²K)
- Air leakage : Class 3 minimum according to DIN EN 12207

Reynaers certificates:

- CS 104 door



SUSTAINABLE PRODUCTS | IFT Passivhaustauglichkeit



Requirements:

- $U_{cw} \leq 0.7 \text{ W}/(\text{m}^2\text{K})$
- $U_{cw} \text{ installed} \leq 0.85 \text{ W}/(\text{m}^2\text{K})$
- Temperature factor:
 - $f_{0.2}$ glass/panel edge ≥ 0.73
 - $f_{0.25/0.3}$ wall connection ≥ 0.73
- Wind load resistance $< L/200 @ 2000 \text{ Pa}$
- Watertightness class $\geq R7 (600 \text{ Pa})$
- Impact resistance I3 and E3 (450mm drop height)
- Air permeability A4 (600 Pa)

Reynaers certificates:

- CW 50-HI



SUSTAINABLE PRODUCTS | Minergie



Requirements:

- $U_w \text{ installed} \leq 1.0 \text{ W}/(\text{m}^2\text{K})$
- Air tightness $n50 < 0.6 \text{ vol/h}$ (blowerdoor test)

Reynaers certificates:

- CS 77 window
- CS 86-HI window
- CP 155-LS sliding door



SUSTAINABLE PRODUCTS | Minergie-P



Requirements:

- U_w installed ≤ 0.8 W/(m²K)
- Air tightness $n_{50} < 0.6$ vol/h (blowerdoor test)
- Ψ wall-edge ≤ 0.13 W/(m²K)

Reynaers certificates:

- CS 86-HI window



SUSTAINABLE BUILDINGS | Certification schemes












International evaluation tools:

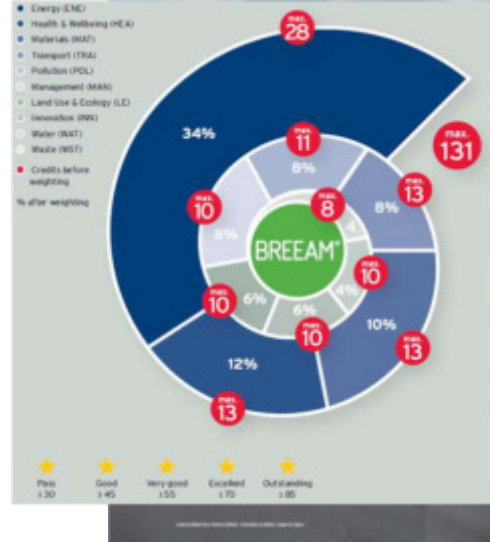


SUSTAINABLE BUILDINGS | BREEAM



BREEAM Europe Commercial 2009

-  Management
-  **Health & wellbeing** (7 issues - 8 credits)
-  **Energy** (2 issues – 10 credits)
-  Transport
-  Water
-  **Materials** (2 issues – 3 credits)
-  Waste
-  Land use & ecology
-  **Pollution** (1 issue – 1 credit)
-  Innovation

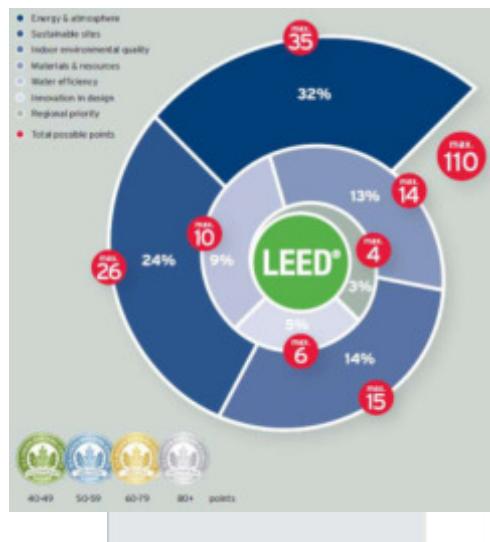


SUSTAINABLE BUILDINGS | LEED



LEED 2009 New Construction

-  Integrative process
-  Location and transportation
-  **Sustainable Sites** (1 credit – 1 point)
-  Water efficiency
-  **Energy & atmosphere** (3 credits – 11 points)
-  **Materials & resources** (2 credits – 4 points)
-  **Indoor environmental quality** (5 credits – 5 points)
-  **Innovation** (1 credit – 1 point)
-  **Regional priority** (1 credit – 1 point)



RESEARCH PROJECTS | Circular retrofit lab



Horizon 2020



- EU research and innovation programme
- Targeted funding
- Bring ideas to market
- Economic growth

Buildings as Material Banks



- Circular economy in building sector
- 7 topics
 - Materials passports
 - Reversible building design
 - Data management (incl BIM)
 - Circular building business models
 - Policies and standards
 - Case studies and pilots

Van Der Meeren student housing VUB

CIRCULAR
RETROFIT
LAB



- Test how to build with reversible design principles
- Implement material passports
- Demonstrate how dynamic building products can be implemented in buildings

RESEARCH PROJECTS | Circular retrofit lab

**Phase 1:** Prototypes of transformable interior infill

Reversible building elements added during renovation will reduce waste production by 75-90% in future transformations

Phase 2: Transformable external walls

Reuse of structural elements will reduce waste production by 50-70%
Reduce waste production by 75-90% in future transformations

Phase 3: Transformation and reconfiguration of modules

New infill, configurations and functions are implemented, demonstrating flexibility of initial design towards future transformations



RESEARCH PROJECTS | Integrated facades as a product-service system



Visual Communication

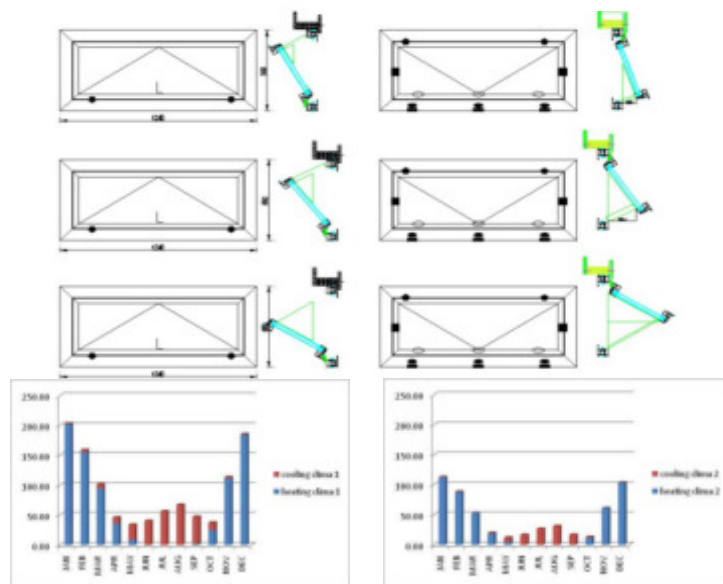
Purpose:

- Evaluate financial and energetic performance
- Investigate potential for façade leasing based on performance
- Propose steps for replicating and upscaling for market implementation



4. Advanced Functions / Profit-Generating Functions (Exchange)
- LED (Media Projection)
 - Green facade (Passive Air Purification System)
 - Green facade (Food or algae production)
 - Monitoring Systems
 - Adaptable facades (eg. U-Value)

RESEARCH PROJECTS | Natural Ventilation

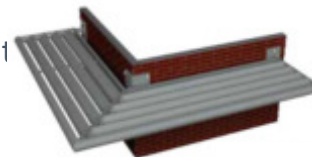


SOLUÇÕES ACTIVAS E PASSIVAS, SUSTENTABILIDADE



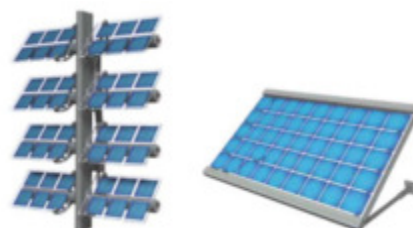
SISTEMAS PASSIVOS

- Controlo térmico por contenção de trocas
- Controlo lumínico através de luz natural e sombreamento
- Qualidade do ar interior por ventilação controlada
- Abertura, fecho e manuseamento manual
- Segurança contra intrusão



SISTEMAS ACTIVOS

- Controlo térmico com aquecimento e arrefecimento
- Controlo lumínico por iluminação artificial
- Qualidade do ar interior por ventilação forçada
- Abertura, fecho e manuseamento electromecânico
- Segurança contra intrusão por alarmes activos



SOMBREAMENTO E CONTROLO SOLAR



CARACTERÍSTICAS

- Diversas opções de lâminas
- Móveis e fixas
- Transparentes ou opacas
- Rectas ou curvas
- Dimensões variadas
- Várias tipologias de aplicação

SHADOW ANGLES EAST FAÇADE (50°LeN = BRUSSELS)



VENTILAÇÃO | Produto ventalis integrado

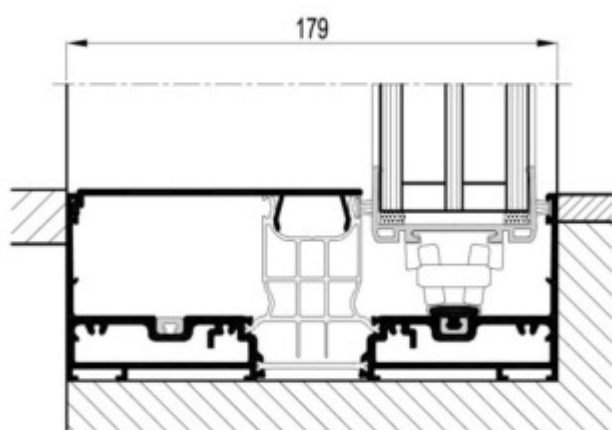


CARACTERÍSTICAS

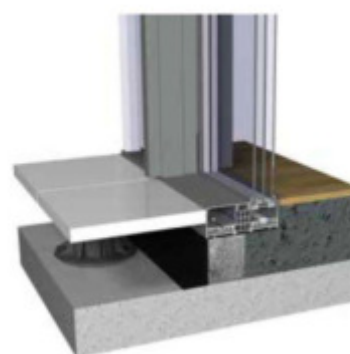
- Integração noutros sistemas como giratórios ou deslizantes
- Controlo passivo da ventilação natural
- Manutenção dos desempenhos térmicos, acústicos e AEV
- 50 m³/h por metro linear em sistemas giratórios
- 60 m³/h por metro linear em sistemas deslizantes



ISOLAMENTO TÉRMICO E CONDENSAÇÕES



$$U_w = \frac{A_f * U_f + A_g * U_g + l_g * \Psi}{A_w}$$



ISOLAMENTO TÉRMICO E CONDENSAÇÕES




Altura máx: 3 m Altura máx: 2.4 m



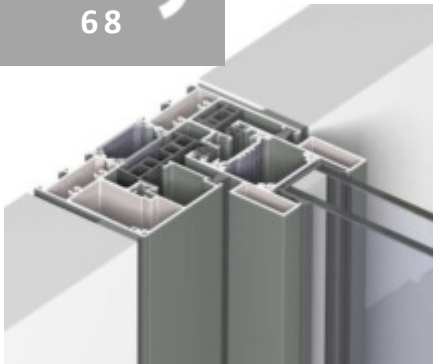

CP 155 Minergie CP 155 Hi-Finity CP 130 CP 68 CP 50 CP 45 Pa

Uf 1.08 W/m²K Uf 3.5 W/m²K

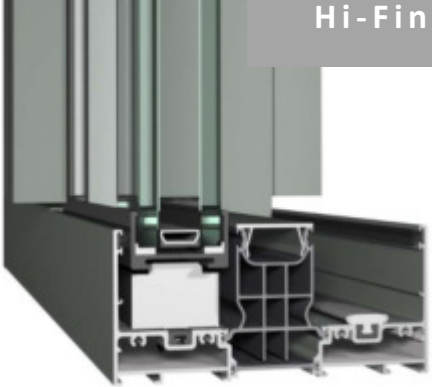

SOLUÇÕES MAIS REQUISITADAS — Hi-FINITY vs SP68



SlimPatio 68

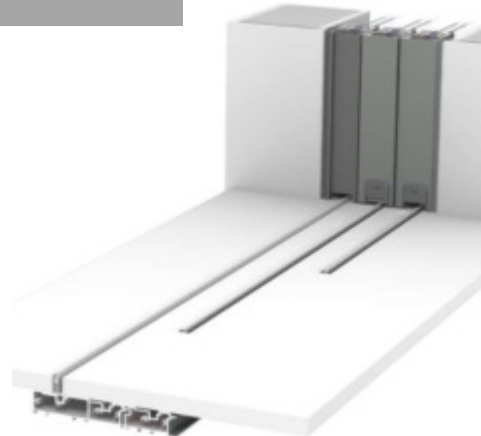
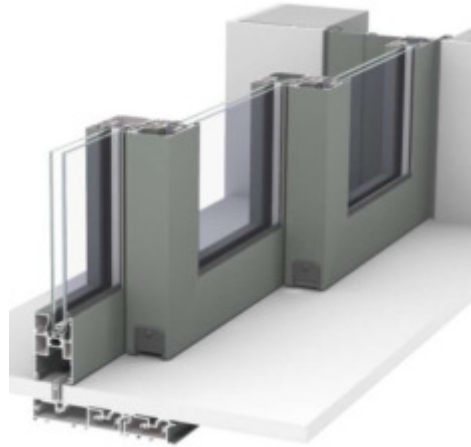
Hi-Finity

SOLUÇÕES MAIS REQUISITADAS — ConceptPatio 130



CP 130



SOLUÇÕES MAIS REQUISITADAS — SL 38 vs ML 10



SlimLine
38

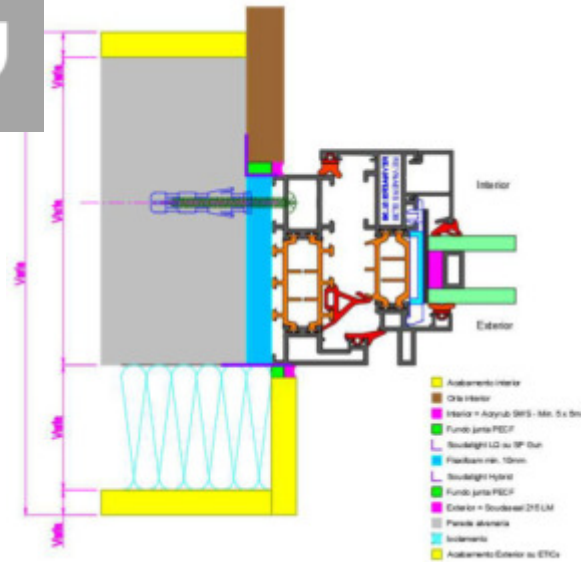
Masterline
10



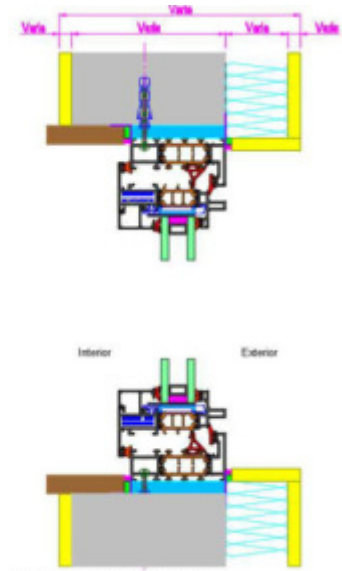
SOLUÇÕES MAIS REQUISITADAS — SL38 PassivHaus



Corte
Ligação



- Acabamento Interior
- Chão Interior
- Interior = Ansysub 985 - Min. 5 x 8mm
- Fundo janela PEGCF
- Stoufflight 122 ou 130 - 2mm
- Fluorocarbon min. 10mm
- Stoufflight Hybrid
- Fundo janela PEGCF
- Exterior = Stouffwall 215 LM
- Parede alvenaria
- Isolamento
- Acabamento Exterior ou ETICs

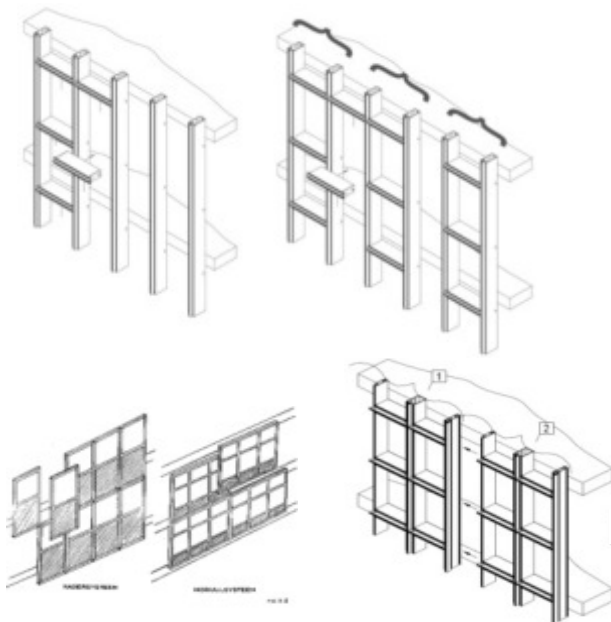


Corte Vertical - Escala 1:2

SOLUÇÕES MAIS REQUISITADAS — CW 50 vs CW 65



Produção e
Pré-
Produção



QUESTÕES?



obrigado