

DIDA RESEARCH WEEK



UNIVERSITÀ
DEGLI STUDI
FIRENZE



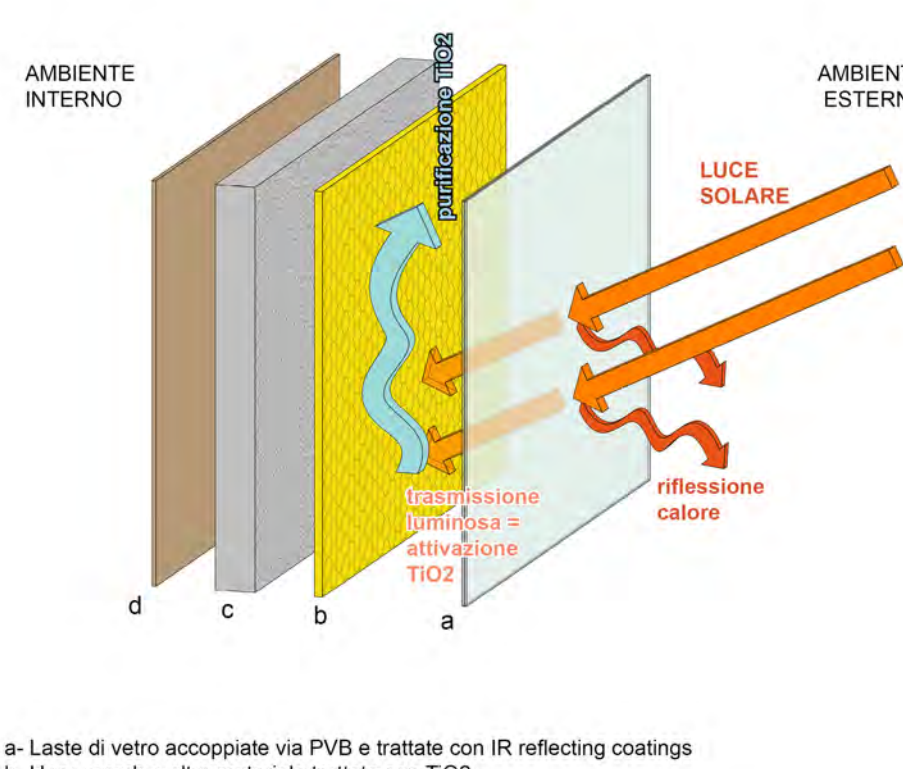
SELFIE



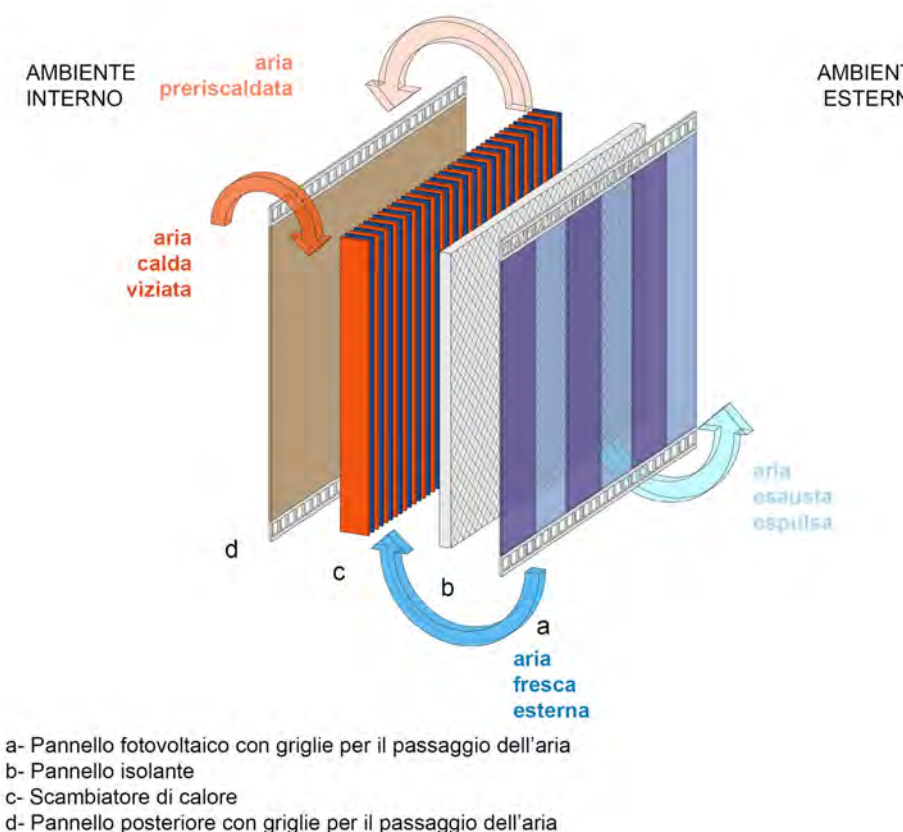
Smart and Efficient Layers For Innovative Envelope

Multi-functional and adaptive building envelopes can provide step-change improvements in the energy efficiency and economic value of new and refurbished buildings, while improving the wellbeing of building occupants. They therefore represent a significant and viable contribution meeting the EU 2020 targets. Innovative façade systems research, finally, opens new scenarios for innovation of envelope systems for nZEB, in the field of technological research. They foreshadow the possibility of experimentation for the future, with the goal to define a general evolution in the way to design, to build and to manage smart buildings future generation. Project SELFIE aims, who involved a construction company owner, companies producing material and building systems, university and national research centers, was to develop novel adaptive envelope systems for nZEB facilitating the exploitation of RES at building scale and simultaneously, to improve indoor environmental quality in non residential buildings. Adaptive envelope have showed a significant technological evolution on last decade thanks to the possibility of integrating smart materials and building management systems. Adaptive facades are able, in fact, to change their architectural configurations and energy features in order to answer in real time to climatic conditions. SELFIE concept is foreseen to be like an adaptive system where it will be possible to integrate modular components developed with smart materials, to produce renewable energy, reducing the total thermal value of the envelope and increasing building energy and environmental performances.

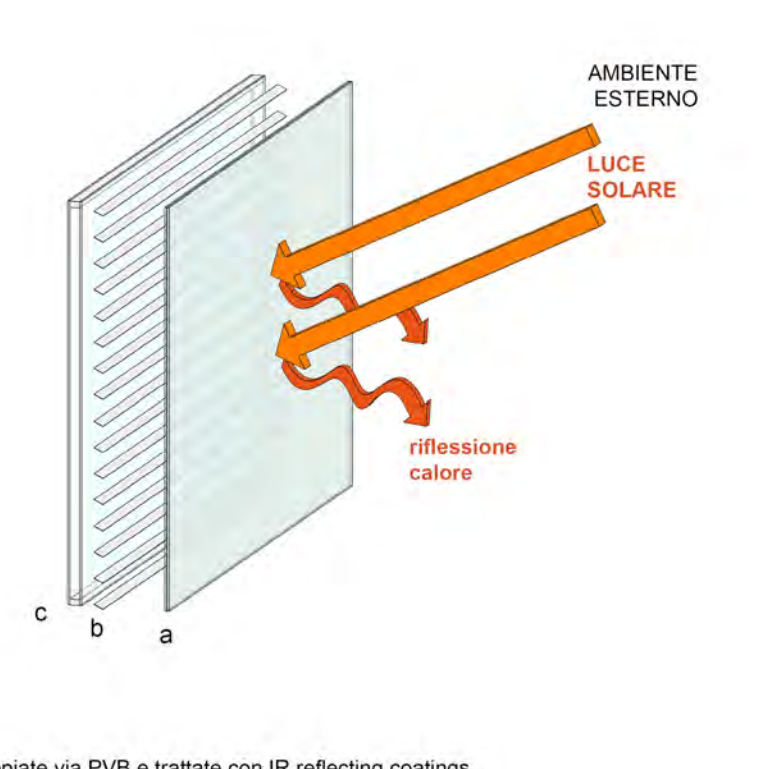
SELFIE 1 VENTILATED OPAQUE FACADE



SELFIE 2 HYBRID OPAQUE FACADE



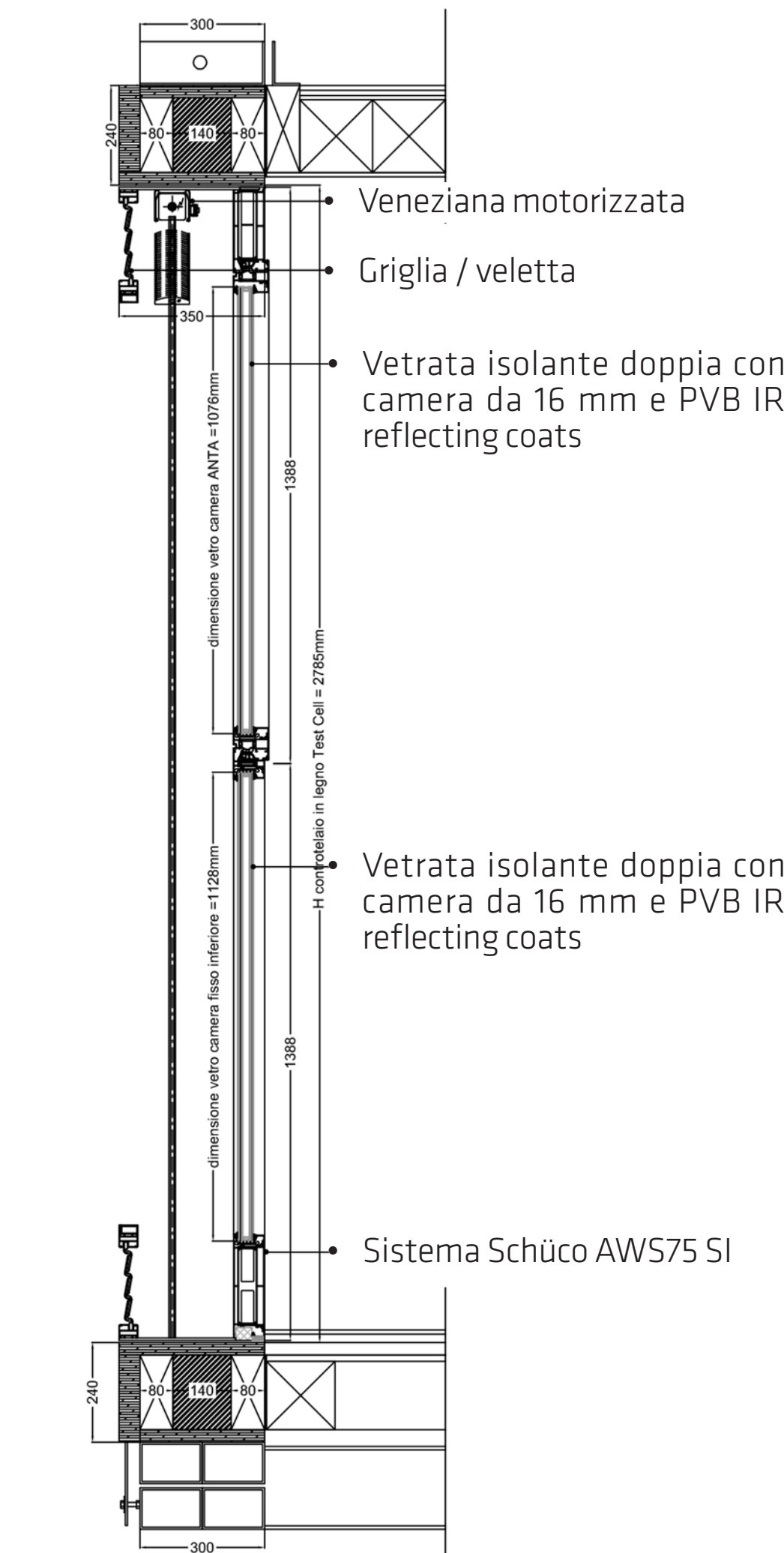
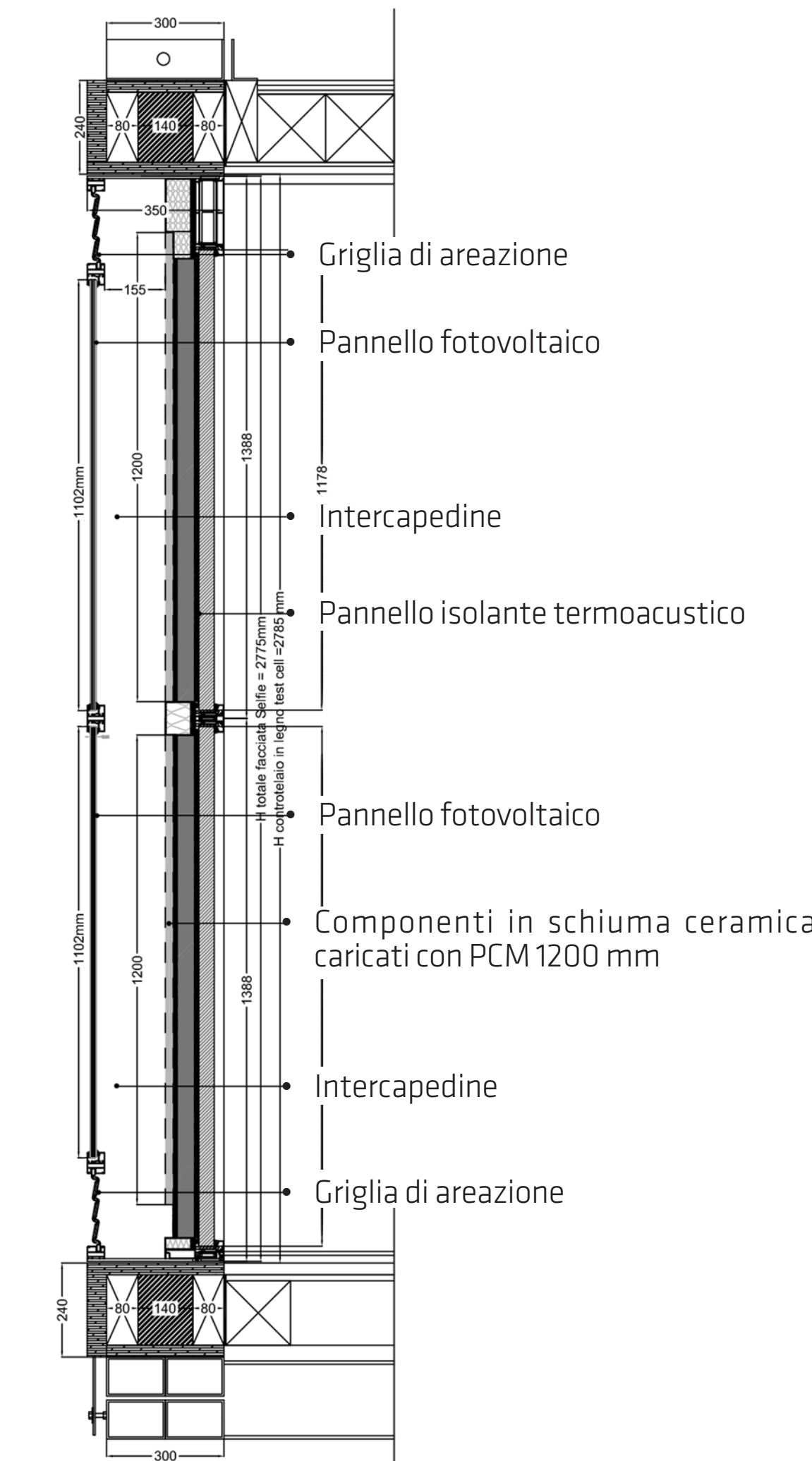
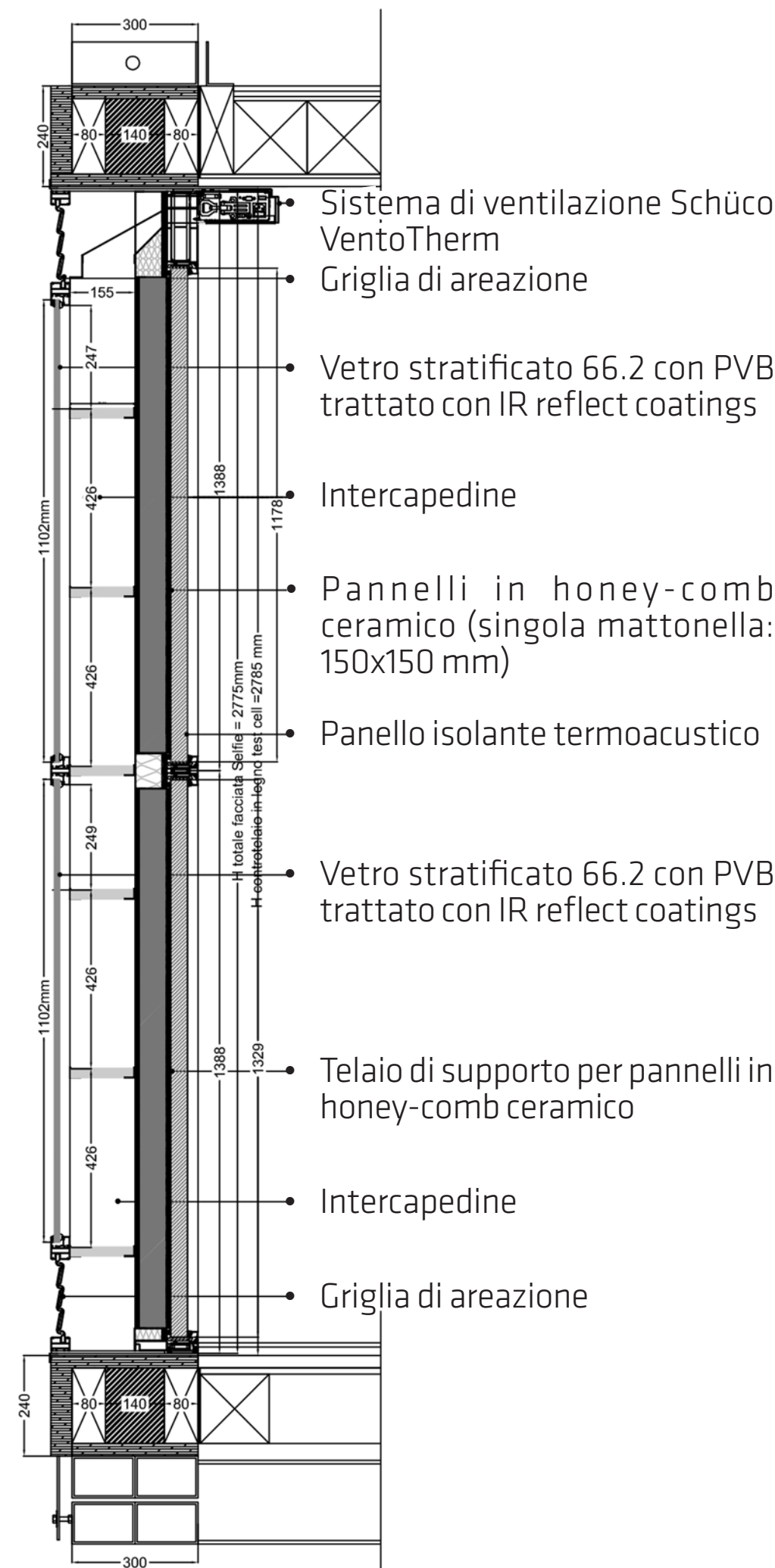
SELFIE 3 GLAZED FACADE WITH SUN SHADING



a- Laste di vetro accoppiate via PVB e trattate con IR reflecting coatings
b- Honeycomb o altro materiale trattato con TCO2
c- Foam glass caricata con PCM
d- Stato di chiusura e supporto

a- Pannello fotovoltaico con griglie per il passaggio dell'aria
b- Pannello isolante
c- Scambiatore di calore
d- Pannello posteriore con griglie per il passaggio dell'aria

a- Laste di vetro accoppiate via PVB e trattate con IR reflecting coatings
b- Interscopio con sistema di schermatura
c- Vetromembrana



PUBLICATIONS

Gallo P. , Romano R. 2017, *Adaptive box window, developed with innovative nanomaterial, for a Sustainable Architecture in the Mediterranean Area*, in CISBAT 2017 International Conference - Future Buildings & Districts - EnergyEfficiencyfrom Nano to Urban Scale, Energy Procedia, vol. 122, Edited by Jean-Louis Scartezzini

Gallo P., Romano R. 2016, *The Selfie Project. Smart and efficient envelope; system for nearly zero energy buildings in the Mediterranean Area*, in Advanced in Architecture and Civil Engineering Conference, 25-26 April 2016, Singapore, 4th Annual International Conference on Architecture and Civil Engineering

Gallo P., Romano R. 2017, *Adaptive facades, developed with innovative nanomaterials, for a Sustainable Architecture in the Mediterranean Area*, in International High - Performance Built Environment Conference - A Sustainable Built Environment Conference 2016 Series (SBE16), iHBE 2016, 17-18 November, 2016, Sydney, Elsevier, Procedia Engineering no. 180 pp. 1274 - 1283

Romano R., Gallo P. 2016 , *The SELFIE Project. Smart and efficient envelope system for nearly zero energy buildings in the Mediterranean Area*, «GSTF Journal of Engineering Technology», vol. 4 no. 4



19 - 23 FEBBRAIO

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