



FP7-ENERGY-2013-1

Research and development of innovative solar thermal facades

FLUIDGLASS

Solar Thermal Glass Facades with Adjustable Transparency

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Specifications for all components for collector and façade system

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AUTHOR

Author	Institution	Contact (e-mail, phone)
Michalis Stylianou	CYRIC	michael@cyric.eu
Panayiotis Philimis	CYRIC	info@cyric.eu
Alessandro Giusti	CYRIC	alessandro@cyric.eu
Kaja Koscielniak	USTUTT	kaja.koscielniak@ilek.uni-stuttgart.de
Jaume Figuls	USTUTT	jaume.figuls-soler@ilek.uni-stuttgart.de
Martin Moisi	HOVAL	martin.moisi@hoval.com
Simon Felsenstein	GLASSX	simon.felsenstein@glassx.ch

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Work Package Leader	Simon Felsenstein	25.02.2014
Project Manager	Václav Smítka	25.02.2014
Coordinator	Daniel Gstöhl	25.02.2014

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Point of Contact	Name: Michalis Stylianou Partner: CYRIC – Cyprus Research & Innovation Center Ltd Address: P.O.Box: 25190, 1307 Nicosia, Cyprus Phone: +357 22 777 200 E-mail: michalis@cyric.eu
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Executive Summary

FLUIDGLASS is a unique and innovative product and thus requires new developments in most of its aspects and components. The components defined within deliverable D1.1 such as the facade system and control /monitoring system, belong to the above mentioned category and require new concept designs and solutions ensuring the feasibility of the overall FLUIDGLASS system and its ability to provide a non-trivial approach to building facade, solar thermal, shading and HVAC systems.

The scope of this deliverable is to define the specifications of the following:

- Monitoring and Control of FLUIDGLASS System
- Mechanical properties and layout of FLUIDGLASS Facade System
- Deliverable D1.3 was initially defined to contain the specifications of the HVAC Components, the Device to Control the Fluid Transmittance. These specifications have been defined sufficiently in D1.2, D1.4 and D1.5.

The research process within deliverable D1.3 has lead both to taking final decisions and narrowing down the possible options on various aspects of the FLUIDGLASS Control and Monitoring and FLUIDGLASS Façade System. The most important decisions taken are:

FLUIDGLASS Control and Monitoring System

- We have identified 2 different topologies for the FLUIDGLASS Control and Monitoring System Architecture (a) Hybrid and (b) Centralized. Based on the current status of the project and what has been defined regarding the overall FLUIDGLASS System operation and deployment, we tend to adopt the Hybrid Architecture. Hybrid Architecture offers great flexibility for the installation of the system, especially in retrofit applications and appears to be more cost effective.
- A matrix, including all the control and monitoring points required for the effective operation and monitoring of the FLUIDGLASS System, has been created. The identified points determine the number and type of inputs and outputs that have to be supported by the system controllers.
- A strategic decision on using an existing HVAC Control System provided by the project partner HOVAL has been taken. A number of problems and barriers occurring from this decision have been identified and a number of possible solutions have been proposed. The proposed solutions include the option of the alternation of HOVAL HVAC Control System or the generic development, jointly with HOVAL, of a new HVAC Control System based on their working platform, in order to conclude with an HVAC Control System able to provide, beside the basic HVAC Control options, all the other specific options required for the efficient operation of the FLUIDGLASS System.
- A number of communication protocols have been examined and a short list of 2 has been concluded. The 2 final options include the use of BACNet or MODBUS protocols. We decided though to leave the selection of the communication protocols open since it is a field where there is vast development during the last years and we believe that many other options may occur before the end of the project, including the option of wireless communication protocols.

FLUIDGLASS Façade System

- The requirements to be achieved were set up (2.4.1 to 2.4.18).
- Agreement on the development of two façade typologies: Transom & Mullion and Modular.
- Profile to use in both cases was selected.
- Agreement on the dimensions of the FLUIDGLASS elements and maximal thickness of the infill.
- Decision to use reinforcement because of the increase of the glass infill.
- First thoughts about the connection between the façade modules and the building and the connection between the façade frame and the glazing unit were made.
- First thoughts about the piping and perforations within the frame were made.