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BUILDING FUTURE Lab.: a great infrastructure for testing


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Abstract

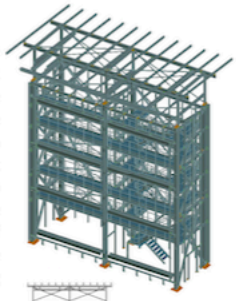
The great infrastructure for research "BUILDING FUTURE LAB." created by the Università Mediterranea di Reggio Calabria through EU funds PON-MiUR Call no. 254/Ric. 2011 (8.6 M€), represents a technological innovation for Testing Advanced building performance. The BFL exceeds the traditional transfer method of constructive experiences, and strives to achieve a transfer of technology and skills-based testing for the definition and certification of performance. Within this project there are some patents in investigation.

Introduction

The project is divided into 8 sections for 5 Operational Objectives. The operative sections are strongly related and provide dynamic TEST relating to the Sustainable Energy and Environment; Testing our leathers and components, through the TEST MAT&COM, subsystem building through the TEST LAB, TEST CELL and TEST ROOM; morphological systems through the TEST DIMORAProject&Co; structural systems through the TEST DINAMICA and buildings in use through the TEST MOBILE; buildings in extreme conditions through the TEST WATER; completes the COGNITIVO Lab. defining committed to the innovation of the project. The division "Test LAB - Test CELL - Test ROOM", called "Catalogue of Open System", designed and realized with the Robert BOSCH REXROTH group, aims to build and enhance a comprehensive testing of constructive system that has a high degree of control of the internal, external and boundary conditions, of a specific constructive system and with a measurement instrumentation, which may be the solution to overcome the criticalities and to enable the use of DEFINED parameters and characteristic of the component.

TEST LAB

The realization of a large test chamber is crucial to test the real capacity of the facades, which is in fact aimed at verifying the compliance with legislation and performance levels of MOCK-UP of curtain walls. Once defined, the MOCK-UP in 1:1 scale of the facade up to 12 meters high and 12 meters in height, is built in the test chamber and it undergoes a series of tests, defined by European regulations which establish the question whether the statement on performance expectations. The range of tests identified by European legislation covers a wide range of functions required to the facade; The following tests are required by the UNI EN 13830 -Curtain Walling. Product Standard, April 2005 (permeability; water tightness under static and dynamic conditions; withstand wind; impact strength; proof of horizontal displacement).

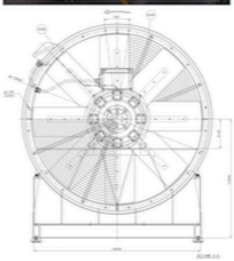



TEST CELL

The Test CELL has the aim to test parts of the facade and roof, both opaque and windowed. The Test CELL has a bearing structure, insulated. The test chamber is then appropriately controlled and equipped by instrumentation, able to check the components under dynamic conditions, to assess the characteristics and the opportunity to use or improvement to the architecture in the Mediterranean climate. It is therefore a certified test lab good for outdoor materials and technological solutions. The Test CELL also allows to test combinations of products of different companies to check the actual performance of technological solutions and innovative construction.


TEST ROOM

The Test ROOM is the real testing environment, and has the dimensions of a room-type, in which the wanted thermal conditions are recreated. The walls on the two sides and the internal partition wall are adiabatic and with high resistance to air, while the fourth wall is removable to be replaced with the different components to be tested. The second level has an additional interchangeable component: the cover element. This section of the laboratory proposes a Test ROOM with different types of installations and thermal facades, which are monitored in terms of energy consumption and environmental conditions. The Test ROOM will be analysed by means of experimental measurements and two software tools for dynamic simulation.



LABORATORY__advanced testing__SUSTAINABILITY__integrated test__DYNAMIC TEST__
sustainability__INTEGRATED TEST__dynamic test__ADVANCED TESTING__laboratory__

Conclusions

The BFL is a candidate to become Accredited Certifier for the Energy Consumption and Environmental Sustainability and like a center for the testing of technological solutions, high-performance energy. SpinOff it will soon make available a catalog of innovative technology services thanks to patents that have been developed.

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