

# EWCHP-2013

EWCHP-2013  
3<sup>rd</sup> European Workshop  
on Cultural Heritage Preservation  
Bozen / Bolzano, Italy, September 16 to 18, 2013

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AFTERNOON SESSION 13:00 to 16:00

## **Energy efficiency of windows in historic context (3ENCULT)**

**Coordinator: Dagmar Exner**

### **Visit of typical examples of historic and refurbished windows in the historic city center of Bolzano**

**Klaus Ausserhofer (60 min.)**

On a guided walk through the historic city center of Bolzano, Klaus Ausserhofer, collaborator of the conservation office of South Tyrol, shows typical historic windows of different construction eras. Among the examples, he explains also specific traditional window constructions that are responsive to the climatic requirements. Participants will see furthermore some examples of refurbished windows and discuss relevant aspects with regards energy efficiency and preservation of the historic value, such as proportions of window frames and sashes, different appearance of historic glazing and new glazing, air- and weather tightness, condition of the weatherboard and coating options. To understand the different energy performance and the risk of condensation or moisture damage of different window typologies, in parallel window details with heat-transfer analysis will be shown and analyzed (on posters).

### **A procedure for conserving the cultural heritage values and upgrading the energy performance of a historic building with focus on windows**

**Franz Freundorfer (60 min.)**

The second part of the workshop takes place in the Public Weigh House in the center of Bolzano, one of the eight case studies of the project 3ENCULT. Based on different historic window typologies and the individual preservation demands of historic buildings, Franz Freundorfer explains challenges and opportunities when it comes to the development of solutions for the improvement of energy performance of historic windows. He presents appearance and problems of industrial (not individual) manufactured refurbishment solutions for historic windows. In this context, he shows the history and development of the industrial produced double glazed windows, used during the last decades.

The participants will see the development of a new high-energy efficient window prototype for the Public Weigh House, a case where the original window could or has to be replaced. Both window prototypes were developed within the project 3ENCULT on the base of a multidisciplinary approach that implemented a strong collaboration and exchange between technical experts and conservators. The participants investigate how the presented procedure can be transferred to other buildings, for repairing and enhancing existing windows and

how the concepts can be applied in different regional window construction traditions. Energy calculations show the energy saving potential of different single solutions in different climate zones with different installation variants into the existing wall.

**Presentation of conservation compatible highly energy efficient windows on-site, developed within the project 3ENCULT**

**Franz Freundorfer, Matilde André (30 min.)**

Finally, the two window prototypes installed in two test room of the Public Weigh House and the box-type window developed for the Aufschnaiter School of Bolzano will be presented. Participants will examine the approach that led to this individual solution, how it was possible to integrate both energy efficiency aspects and conservation demands.

Additionally the participants will have the opportunity to have a look at examples of different types of glazing and recent developments in the field of high-energy performance glazing and its thickness.

**Discussion**

**All participants (30 min.)**

3ENCULT is co-funded by the European Union Seventh Framework Programme (FP7/2007-2013) under grant agreement n° 260162.

