

COST Action FP0702

Net-Acoustics for Timber based lightweight buildings and elements

E-BOOK

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INTRODUCTION

Action FP0702 is a COST action in the field of Forestry and Forest Products. General information about the COST program can be found on the COST Website at <http://www.cost.esf.org>. COST Action FP0702 entered into force on February 2008; **15 European countries as well as Australia and New Zealand** have participated in this Action. The Action lasted until 26 August 2012.

This COST Action has been focused on the **acoustics and low frequency vibration of timber based lightweight buildings**, for which methods for predicting and measuring performances, as well as methods for assessing comfort and acoustically designing buildings are not as well developed as for heavy building. Airborne and impact sound performances, and sound from service equipment have been considered over a frequency range including the low frequencies (50 to 100 Hz) where lightweight buildings are likely to have performances lower than in heavy buildings. Low frequency vibration (below 25 Hz) such as walking induced vibration of floors has also been considered, and particularly its subjective aspect.

Four working groups have been created, dealing with the above aspects: **WG1** on prediction methods for sound and vibration performances, **WG2** on measurement methods for sound and vibration performances, **WG3** on comfort assessment for sound and vibration and **WG4** on building acoustic design.

During this four year Action, knowledge has increased by gathering existing data, discussing proposals during WG meetings as well as by supporting, guiding and coordinating new research activities at national level in order to benefit from this research work. The main outcomes of these activities, focused on predicting and measuring building performances as well as assessing comfort and designing buildings with proper serviceability are presented in this **e-book**.

The e-book is divided into four chapters, corresponding to the activities of the four working groups:

- In [Chapter1](#) (**WG1** - Prediction methods for sound and vibration performances), the final proposals for prediction of the relevant building performances, resulting from discussions during WG1 meetings, are presented separately for acoustics and vibration; the documents produced are technical proposals which can be used as work documents in standardization committees
- In [Chapter2](#) (**WG2** - Measurement methods for sound and vibration performances), several papers propose general methods adapted to lightweight wood frame buildings for measuring sound or vibration quantities, identified in WG1



and relevant for evaluating and predicting building performances. These papers have been written by different WG2 members, from work performed or knowledge gathered in their institutes.

- In [Chapter3](#) (**WG3** – Comfort assessment for sound and vibration), a single document is presented, summarizing the WG3 activities, focused on the vibrational serviceability of timber floors and discussing and comparing the different criteria and variants used in the European countries and beyond. It should be noticed that not much has been done concerning comfort assessment for low frequency sound, mostly because of the lack of activities at the member institutes on this subject or because of activities performed for the private sector and not publicly available; however, this subject is part of the objectives of the on-going COST Action TU0901 (in activity up to the end of 2013), focused on harmonizing sound descriptors and classification schemes in Europe for all type of buildings and where several members are also members of FP0702; hopefully, useful results will be soon produced.
- In [Chapter4](#) (**WG4** – Building acoustic design), a single document is also presented, which goal is to give an idea of the different construction methods and the different building elements and junctions between building elements. An overview of “do’s and don’ts” are also given, as well as examples of innovative solutions.

As said above, one of the main objectives of the Action was to support, guide and coordinate new **research activities at national level** on timber based lightweight buildings in order to benefit from the results of these activities and make progress (since no research is financially supported by COST). However, **only the main outcomes are presented in this e-book** and not the results of all the studies performed at the different institutes during the action. In order for the reader of this e-book to have a better idea about these research activities and find information, an “overview of research” document has been created giving the current (and previous) research topics performed at the different institutes and the associated available papers and presentations. This document is given in [Chapter5](#).

Finally it should be mentioned that **3 workshops** have been organized during this four year Action: in Växjö Sweden (2009), Delft The Netherlands (2010) and Zürich Switzerland (2011), where technical presentations on the different subjects considered were given; a list of these presentations can be viewed (and downloaded) on the Action Website [<http://extranet.cstb.fr/sites/cost>] and has also been put on the USB keys distributed at the FP0702 Final Conference organized in Grenoble France on October 18, 2012.



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[Chapter5](#): Overview of research at the main member institutes