



Klas Hagberg

Coordinator Silent Timber Build

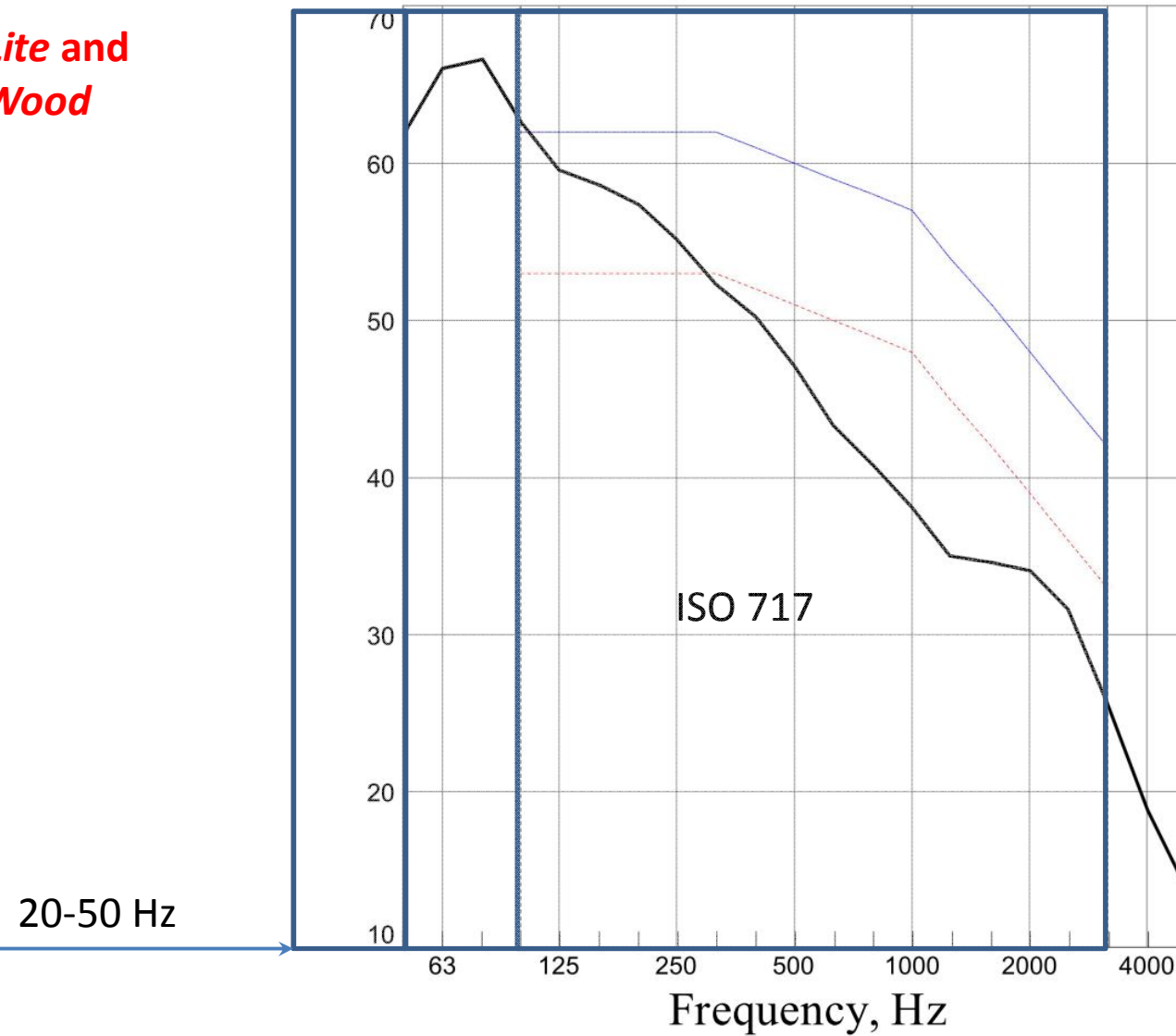
Twitter: @klashagb

Introduction

- Thanks to have this Canadian Introduction!
- Wood is good for the future but still we need to provide more knowledge, more knowledge → stronger industry
- The acoustics always decides the dimensions of a structure floor structure (and wall structure)
 - Why is it always 250 mm of concrete in a floor structure?
 - Why is it 200 mm concrete in a wall?
 - Why do we need HD/F 265
 - Etc etc
 - Because With these measures you always fulfill sound class B
- Why do we need 500 mm in the floor structure of a wooden building?
- **It is always the acoustics and vibrational characteristics that decide the structural dimensions**

Where are we today?

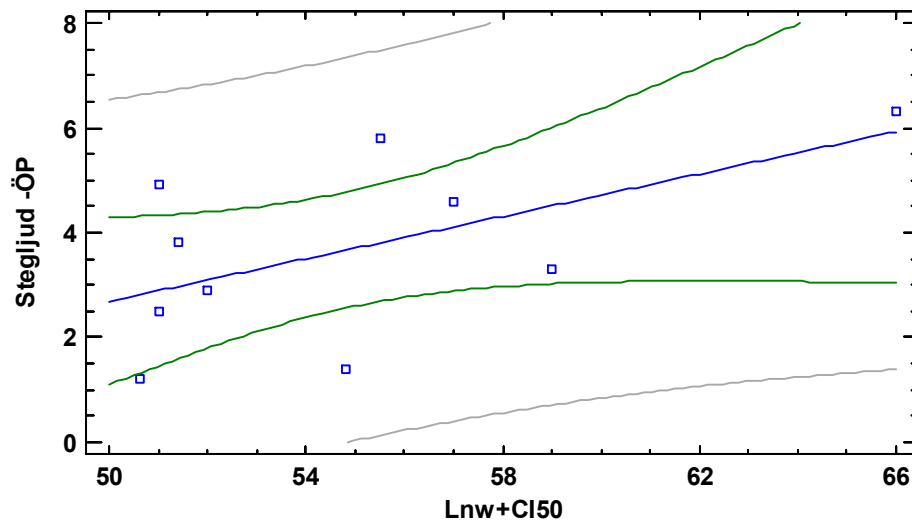
*AkuLite and
AcuWood*



Where are we today?

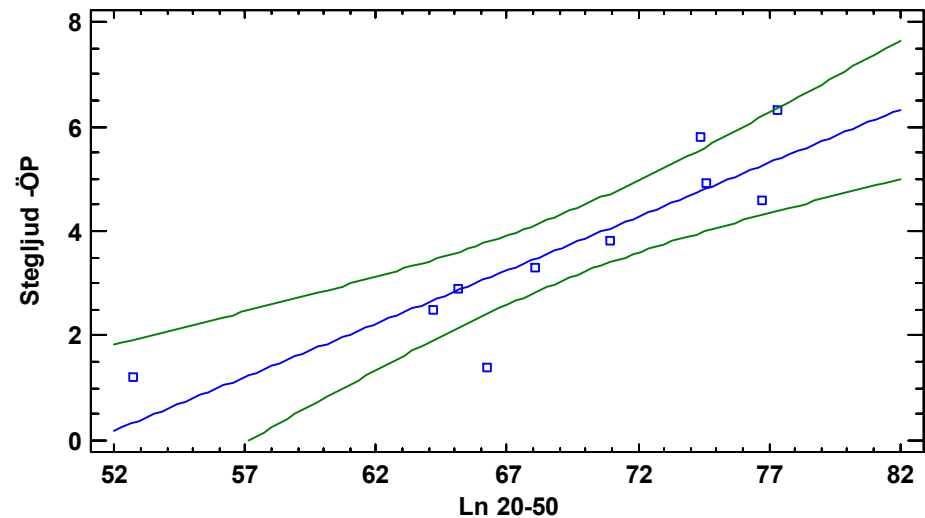
- The latest research indicates that very low frequencies have to be considered as sound insulation is evaluated in light (wooden) constructions
- Impact sound evaluation, two examples of correlation

50 Hz - 3150 Hz, ISO 717



$R^2 = 32\%$

ONLY 20-50 Hz!



$R^2 = 78\%$

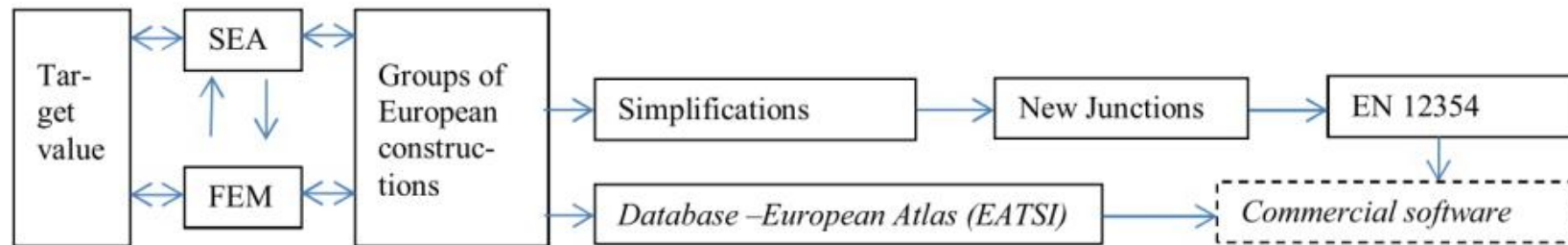
Where are we today?

- One project continues in order to further investigate the results from *AkuLite* and *AcuWood* – improved criteria for sound insulation
 - “New improved building technique-neutral criteria for sound insulation evaluation” Luleå Tekniska Universitet, started spring 2014
- More info will also come from Finland and Valtteri Hongisto
- No matter what –
 - In order to further develop higher and higher buildings in wood low frequencies have to be considered to larger extent and at earlier stages, we cannot afford to fail!
 - To do this **calculation models** are needed.
- WVN+ projektet “Silent Timber Build” has as the main aim to develop new calculation models for wooden constructions considering the entire frequency range 20 – 5000 Hz.



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- The idea is to use FEM and SEA in order to cover "the entire" frequency range, 20-5000 Hz. New evaluation criteria from the latest research will be considered.



- The work is carried out in five "Work Packages", three technical" WP:s (WP 1-3) and one WP (WP4) for dissemination of the results and finally one WP (WP5) for coordination / project management

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WP1: Prediction tools, low, medium and high frequencies

WP 1 – Prediction tools for low, medium and high frequencies

Initial work to state European target values from findings in ongoing and recently finished projects, “state of the art”. From existing knowledge develop new prediction models using FEM, SEA and other approaches if necessary and to connect these methods depending on frequency range

WP2: Validation of prediction tools and constructions

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This work package will validate the theoretical models developed in WP 1 by using already available and also new measurements from laboratory and field. Analysis will be made and optimized constructions will be used in validation procedure

WP3: European Timber Sound Insulation Atlas

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Pioneer work made by Lignum will be used in order to apply the theories directly in an application for end users. Hence input from WP 1 and WP 2 will be applied in a web based interface for calculation of wooden structural systems

Silent Timber Build – expected results

- Establish **basis** for standardized engineering calculation models, applicable to light (wooden) assemblies / constructions
- Increased knowledge regarding calculation models for multi storey wooden buildings
- Increased knowledge regarding sound insulation optimized building system calculated considering future requirements
- Create possibilities for future optimization of building constructions by using correct and verified calculation models in the design stage in order to reduce costs and strengthen the competitiveness within the wooden industry sector

Silent Timber Build – expected results – long term

- Increased knowledge regarding sound and vibrations in light (wooden) constructions which is necessary for
 - An increased positive development for new acoustical solutions in the wooden sector
 - To create innovative design “guidelines” in the design stage
- To improve the sustainability agreement, that is when sound and vibrations can
 - Be predicted based on modern design criteria / measures
 - And when
 - Final results in a building fits to the predicted value

Silent Timber Build - konsortium

- Ten European research institutions
- Six European Industry / Consultant partners

www.silent-timber-build.com

- We also have a parallel project represented here today (HCLTP)

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- We started in March (July) 2014,
- We expect to be "ready" in April 2017
- This seminar ➔ give a "boost" for us to focus on the right things
 - So, now you will have a lot of interesting presentations
 - I hope for some nice discussions with help from one of our partners, the moderator Christian Simmons



Finally!

- We are on the way and I am happy to lead this project
- The higher house the more complex, we cannot afford to fail regarding acoustics and vibrations.
- Thanks for coming to this seminar!
 - Klas Hagberg klas.hagberg@wspgroup.se / klas.hagberg@sp.se