



# AcouSYS V4: Optimizing acoustic performance of a multilayer system



AcouSYS is a prediction software for multilayer system's acoustic performance applied to buildings and transportation. Intended for professionals specialized in both fields, this software is reputed for its simulations' reliability. It allows you to calculate acoustic performances of your construction projects' components in a multilayer approach (material/system/structure).

## OBJECTIVES:

This training allows you to:

- Quickly run reliable calculations of multilayer systems' acoustic performance
- Understand transfer matrix method
- Getting started with AcouSYS software
- Determine limits and fields of validity of the obtained calculation results
- Be aware of the importance of the input data's quality and how to obtain them

**Training supervisor:** Thibault BLINET, Research and expertise Engineer, CSTB

## LE PLUS DU STAGE

- E-learning training: you can freely adapt your training rhythm

## TARGET

Industrialist  
Engineering consultants  
Reaserchers

## PRE-REQUISITE

Be familiar with the acoustic fundamentals, more specifically in the "systems" scale

## TEACHING METHODS

- Theoretical and methodological sequences
- 10 real software case studies

## ASSESSMENT

Quiz at the end of the training

## PRACTICAL INFORMATION

**Duration:** 2h30

**Access to the platform:** 3 months

**Cost:** 190€ excluding VAT

## CONTACT

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## PROGRAM

### E-learning training

*This training is available on the CSTB Formations' e-learning platform*

#### Module 1: Theory

- Acoustic calculations using the transfer matrix method
- Input data: physical properties of materials
- Considering finite dimensions: the FTMM approach
- Considering vibration transmissions across frame elements: the hybrid SEA/TMM approach
- Homogenizing complex systems

#### Module 2: Using AcouSYS and case studies

- Interface overview
- Case studies:
  - Sound reduction index R (and improvement  $\Delta R$ )
    - Case 1 – Sandwich panel
    - Case 2 – Lining bonded by dabs on concrete supporting wall
    - Case 3 – Frame partition with metal frame
- Sound absorption coefficient  $\alpha$ 
  - Case 4 – Insulating material
  - Case 5 – Perforated suspended ceiling panels
- Normalized impact sound pressure level  $L_n$  (and reduction  $\Delta L$ )
- Case 6 – Tiled floor with acoustic underlayer
- Rainfall sound intensity level  $L_i$
- Case 7 – Roofing panel
- Material homogenization
  - Case 8 – Stacked plates (partition)
  - Case 9 – Profiled material (stiffened plate)
  - Case 10 – Alveolar material (hollow brick)

#### ► Assessment quiz