

**Acoustic
Services**

flexxica

Acoustic Services

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1. Types of acoustic services

A) BASIC

Acoustic consultations - take place on site, by e-mail or by phone with our acoustician. Such consultations are only approximate and take about one to two hours, depending on the case.

Acoustic measurements - it's a precise analysis of the level and characteristics' of the sound in the given environment, using certified measuring equipment. What is measured? For instance - measurements of reverberation time in the room or measurements of building partitions' insulation (transmission of the sound between two neighbouring rooms) .

Acoustic simulations - consist in creating calculative model of the building or the room together with all material parameters closed to real ones. Basing on this, the acoustic priorities, potential project downsizes as well as suggested solutions are made. Simulation of the current reverberation environment and different options of acoustic adaptation accelerate the processing of the project and reduce the costs concerning deficiency, underestimation or overestimation of designed acoustic elements,

Acoustic calculations - it's a method based on the overall quantity of required acoustic materials using special algorithm that takes into account such data: acoustic absorption of the materials, equivalent area of the sound-absorbing surface of room's elements (i.e surface of carpet with specified absorption coefficient, surface of windows etc.).

Acoustic measurements, simulations or calculations are presented in the form of report containing: measuring equipment specification, methodology of the conducted analysis, results, conclusions and guidelines.

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1. Types of acoustic services

B) SUPPLEMENTARY

Design of individual acoustic solutions - In cooperation with acoustician, we can design panels based on individually defined visual or listening preferences.

Choice of acoustic solutions - In the form of a guideline or executive project, you receive a specific list of acoustic elements, instruction how to arrange them in the room and the way of assembly.

Analysis of the building documentation - On the basis of the provided documents, we verify the projected solutions for accordance with legal requirements and norms.

Project optimization - The project together with implemented acoustic solutions are verified in terms of acoustic efficiency and cost optimization.

Project supervision - At the early stage of the design process, we check whether the project is in accordance with legal requirements.

Executive supervision - At the project execution stage (on the construction site) we conduct a verification process that checks accordance with norms, legal requirements etc.; we also verify applied materials or their substitutes in terms of acoustic efficiency and accuracy.

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1. Types of acoustic services

C) SPECIALIST

Acoustic project - contains between 2 and 4 acoustic services (basic or supplementary), i.e. acoustic consultations + acoustic simulations + choice of acoustic solutions.

Typically, acoustic project refers to 1 to several rooms.

Acoustic audit - contains 5 and more acoustic services (basic and supplementaries). It is the most profound and professional form of acoustic services provision. Its range is individually selected depending on client needs or building requirements.

Acoustic audit applies to the whole office area (or whole office building) containing rooms of varied functionalities and requirements (for instance: open space's, conference rooms, kitchens, corridors, meeting room's etc.)

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ACOUSTIC MEASUREMENTS

A) Measurement of acoustic insulation of building interior partitions (from airborne sounds)

together with the analysis and report (*structural walls, partition walls, glass walls and other building partitions*) in accordance with current standards and legal requirements. Measurements can be carried out at the stage of construction as well as at the stage of building commissioning. Measurements are performed in conformity with PN-EN ISO 140-4 or PN-EN ISO 16283-1, while their assessment in accordance with PN-B-02151-3 and PN-EN ISO 717-1.

B) Measurement of acoustic insulation of building interior partitions (from impact sounds)

together with the analysis and report (*ceiling, etc.*) in accordance with current standards and legal requirements. Measurements can be carried out at the stage of construction as well as at the stage of building commissioning. Measurements are performed in conformity with PN-EN ISO 140-7 or PN-EN ISO 16283-2, while their assessment in accordance with PN-B-02151-3 and PN-EN ISO 717-2.

C) Measurement of acoustic insulation of building exterior partitions (*external walls, building elevation, etc.*) in accordance with current standards and legal requirements. Measurements are performed in conformity with PN-EN ISO 140-5 or PN-EN ISO 16283-3.

D) Measurement of A sound level together with analysis and report (i.e. in the room, from facilities for technical equipment - ventilation, air-condition, etc.). Measurements are performed in conformity with PN-EN ISO 16032, while their assessment in accordance with PN-B-02151-2.

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ACOUSTIC SIMULATIONS

Simulation of acoustic insulation of building partitions (*walls, ceilings, glass, roofs, etc.*).

ACOUSTIC CALCULATIONS

A) Project calculations of acoustic insulation of building partitions between the rooms from airborne sounds, in accordance with PN-EN ISO 12354-1.

B) Project calculations of acoustic insulation of building partitions between the rooms from impact sounds, in accordance with PN-EN ISO 12354-2.

C) Project calculations of acoustic insulation from airborne sounds transmission from the outside in accordance with PN-EN ISO 12354-3.

D) Project calculations of acoustic insulation regarding transmission of the noise from the building to the outside environment in accordance with PN EN ISO 12354-4.

E) Project calculations of surface sound pressure level in building facilities for technical equipment o in accordance with PN-EN ISO 12354-5.

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ACOUSTIC MEASUREMENTS

A) Measurements of reverberation time together with analysis and report (conference rooms, auditoriums, etc.) in accordance with current standards and legal requirements. Measurements are performed in conformity with PN-EN ISO 3382-2, while their assessment in accordance with PN-B-O2151-4.

B) Specialise acoustic measurements together with analysis and report (cinema hall, listening room, recording studio, concert hall, etc.) in accordance with current standards and legal requirements, for instance EBU-Tech 3276.

ACOUSTIC SIMULATIONS

Acoustic simulations together with analysis and report of any room In the norm, there are detailed requirements for: classrooms, auditoriums, lecture halls, courtrooms, conference rooms, gyms and sport halls, pools, nurseries and kindergartens, after-school rooms, canteens, reading rooms, libraries, atriums, halls, foyers, galleries, exposition rooms, passenger terminals, stations, doctors' offices, treatment rooms, office rooms, open-spaces, social rooms, churches, chapels, concert halls, cinema halls, recording studios, listening studios.

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ACOUSTIC CALCULATIONS

A) Determination of building acoustics' properties (PN-EN 12354-6) – calculations of equivalent area absorption A together with analysis and report of any rooms (according to PN-B-02151-4 there are specific requirements for: large-area offices, office rooms - open space's, bank and officials' rooms, customer service offices, call centers, cloakrooms in schools and kindergartens, workrooms for technical classes and other workshops, patient rooms, waiting rooms, reception points in hospitals and medical clinics, corridors in: schools, hotels, hospitals and medical clinics, staircases in: kindergartens, at schools, health care facilities, public administrations, kitchens and dining facilities.

B) Prediction of sound absorption coefficient α depending on the selected material or materials.

C) Specialist calculations (i.e. listening studios, cinema halls, recording studios)– for instance prediction of room resonance, Schroeder's frequency, Bonello's criteria, Bolt's area.

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