If you are converting a house into flats it is important that you realise that you will need to comply with stringent sound insulation requirements. All dwellings for residential use must meet Document E sound regulations. This regulation states that the separating floor (floor between two separate dwellings) must achieve sound insulation figures of 43dB for airborne sound and 64dB for impact sound.

What regulations must you comply with?

Building Control will expect you to demonstrate compliance with Document E 2003 by undertaking an independent sound test to prove that you have met the standards for sound insulation. These sound tests must only be carried out by either UKAS or ANC approved Acousticians. If the sound tests are not carried out by approved Acousticians then Building Control will not accept the sound test and it would need to be repeated at considerable expense. InstaCoustic work closely with Acousticians and we can make arrangements for the sound tests to be carried out by Acousticians who have the correct accreditation.

How to achieve the sound regulations

A typical timber floor before an acoustic floor and ceiling system have been applied will perform to about 32dB for airborne sound and 70db for impact sound.

This kind of floor will need considerable improvement to meet the requirements of Document E. InstaCoustic is a specialist in this market and we have undertaken with UKAS/ANC Acousticians hundreds of sound tests on timber floors. This extensive testing data has enabled us to develop a combination system that will exceed the sound regulations and avoid the huge cost of sound test failures.

The best way to upgrade a timber floor is to install an acoustic floor and ceiling system (See system AC108/208). When this method is applied InstaCoustic has a 100% record of success.
House Conversions

**What can you do when there is no access to the ceiling below?**

Sometimes it is only possible to treat the floor because there is no access to the ceiling below. In such cases an acoustic floor that reduces both airborne and impact sound is vital. Bonded chipboard and foam products are only suitable to reduce impact sound. You will note that sound test F2 enclosed demonstrates how the InstaCoustic floor system 208 can pass the sound test without a ceiling treatment when a lath & plaster ceiling is present.

**How can you deal with the Fire regulations?**

If Building Control expects you to meet 60 minutes fire resistance between dwellings the InstaCoustic AC90/2FP ceiling system will enable you to meet this standard. Sometimes the flat being converted is above a shop or commercial premises. In such cases there is no access to the ceiling below and the fire regulations cannot be achieved. In these cases the InstaCoustic intudeck insulation bat can be fitted between the existing joists to achieve 90 minutes fire resistance. Please see enclosed data sheet.

**How do I compare manufacturers test data?**

Many suppliers of sound insulation products quote laboratory sound tests to demonstrate the performance of their systems. This causes considerable confusion regarding how well products will perform when they are installed and are sound tested in the structure. Laboratory sound tests do not take account of flanking sound and therefore produce sound insulation figures that cannot be achieved on site. All structures will be subject to flanking sound to varying degrees and therefore field sound test data will show the real performance of a system in a building.

Laboratory sound tests simply measure sound and do not account for flanking sound transmission. All laboratory sound test results will show airborne sound as $R_w (+C_v)$ figures and impact sound as $L_{nw}$ figures, whereas filed tests are shown as $D_{nT,w} +C_v$ (airborne) and $L_{nT,w}$ (impact). When assessing laboratory sound test data, acousticians will typically reduce these test results by 5 to 8dB of flanking sound. When deciding which products to use you should always use field test data that shows the real performance of the system when it is installed.

InstaCoustic systems provide a comprehensive solution to reduce sound transmission and making sure that our clients get it right first time.

**Flanking Sound**

Airborne sound from the Hi-Fi travels through the separating floor and it will also flank down the walls bypassing the floor. Field sound tests measure both forms of sound transmission providing a true indicator of performance.
The AC108 & AC208 combination systems have the ability to pass the pre-completion test and avoid expensive and time-consuming failure. They provide a reliable acoustic solution that meets current noise level regulations for the refurbishment or upgrade of existing dwellings by combining an acoustic floor system and adjustable acoustic ceiling.

**Case Study**

**Project**  Conversion of three storey Victorian terrace into social housing flats
Brixton, London

**Construction**  Masonry with timber joist floor

**Systems used**  AC208

**Testing**  
Impact: 53dB $L'_{nT,w}$  
(Building Regulations requirements: not more than 64dB $L'_{nT,w}$)

Airborne: 51dB $D_{nT,w} + C_F$
(Building Regulations requirements: not less than 43dB $D_{nT,w} + C_F$)
TEST NO. F2  Acoustic Floor System

- **SYSTEM TESTED**
  INSTACOUSTIC SYSTEM 208

- **ADDRESS OF TEST**
  53a & 53b Ivy Crescent, Acton Green, London, W4

- **TESTED BY**
  Before Test Undertaken By Building Research Establishment. After Test Undertaken By Stranger Science & Environment. ‘Ctr Spectrum Adaptation Term’ Test undertaken By noise.co.uk Ltd

- **FLOOR CONSTRUCTION**
  Floorboards on Timber Joists At 450mm Centres

- **CEILING CONSTRUCTION**
  Lath and Plaster

- **TEST RESULTS BEFORE TREATMENT**
  “BEFORE” AIRBORNE NOISE (DnT,w + Ctr) 42 - 8 = 34dB
  “BEFORE” IMPACT NOISE (LnT,w) 66dB

- **TEST RESULTS AFTER TREATMENT WITH INSTACOUSTIC SYSTEM 208**
  “AFTER” AIRBORNE NOISE (DnT,w + Ctr) 52 - 4 = 48dB
  “AFTER” IMPACT NOISE (LnT,w) 47dB

TEST NO. F22  Acoustic Floor & Ceiling System

- **SYSTEM TESTED**
  INSTACOUSTIC SYSTEM 108 & AC90/2FP

- **ADDRESS OF TEST**
  25 Honyatt Road, Cheltenham, Gloucester. GL1 3DU

- **TESTED BY**
  noise.co.uk Ltd

- **CEILING CONSTRUCTION**
  25mm T&G Floorboards, 9” x 2” Joists @ 450mm Centres, 1 x 9mm Plasterboard

- **TEST RESULTS BEFORE TREATMENT**
  “BEFORE” AIRBORNE NOISE (DnT,w + Ctr) 41 - 7 = 34dB
  “BEFORE” IMPACT NOISE (LnT,w) 65dB

- **TEST RESULTS AFTER TREATMENT WITH INSTACOUSTIC SYSTEMS 208**
  “AFTER” AIRBORNE NOISE (DnT,w + Ctr) 60 - 8 = 52dB
  “AFTER” IMPACT NOISE (LnT,w) 44dB
House Conversions

ACOUSTIC FLOOR & CEILING SYSTEM
AC108 & AC208

The AC108 & AC208 combination systems have the ability to pass the pre-completion test and avoid expensive and time-consuming failure. They provide a reliable acoustic solution that meets current noise level regulations for the refurbishment or upgrade of existing dwellings by combining an acoustic floor system and adjustable acoustic ceiling.

Applications

- Refurbishment
- Change of use
- Domestic upgrade
- Level timber floors
- Where floor height is restricted
- Pre-completion testing
- Overcoming acoustic failures
- Fire rated ceiling

Components

<table>
<thead>
<tr>
<th>AC108 – Floor</th>
<th>AC108 – Ceiling</th>
</tr>
</thead>
<tbody>
<tr>
<td>9mm Overlay Board</td>
<td>9mm Overlay Board</td>
</tr>
<tr>
<td>8mm Sound Barrier Pads</td>
<td>13mm Sound Barrier Pads</td>
</tr>
<tr>
<td>6mm Decoupling Fibre</td>
<td>6mm Decoupling Fibre</td>
</tr>
<tr>
<td>THICKNESS – 23mm</td>
<td>THICKNESS – 29mm</td>
</tr>
<tr>
<td>WEIGHT – approx. 18kg/m²</td>
<td>WEIGHT – approx. 22-28kg/m²</td>
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</tbody>
</table>

<table>
<thead>
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<td>6mm Decoupling Fibre</td>
</tr>
<tr>
<td>THICKNESS – 28mm</td>
<td>THICKNESS – 29mm</td>
</tr>
<tr>
<td>WEIGHT – approx. 22-28kg/m²</td>
<td>WEIGHT – approx. 22-28kg/m²</td>
</tr>
</tbody>
</table>

Components

- Water Resistant T+G Overlay Board
- Sound Barrier Pads
- IN1 Decoupling Fibre (grey)
- 1m x 6mm x 20m roll
- Perimeter Support
- 1.2m x 30mm x 6mm

Above weights & dimensions may be subject to slight variation.

Examples

- 9mm Overlay Board
- 8mm Sound Barrier Pads
- 6mm Decoupling Fibre
House Conversions

ACOUSTIC FLOOR & CEILING SYSTEM
AC108 & AC208

System detail illustration
House Conversions

ACOUSTIC FLOOR & CEILING SYSTEM  AC108 & AC208

Adjustable Acoustic Hanger assembly

NOTES:

* When 1 hour fire protection is required, use InstaAcoustic Intumescent Sealant and two layers of 12.5mm Fireline board or similar. Ensure that the boards are staggered so that no joints coincide.

** When fixing the acoustic hangers into timber floor joists there must be a minimum penetration of 30mm into the joist. When fixing into concrete, load tests may be required to confirm the suitability of the fixing and fixing anchor.

*** When fixing perimeter channel there must be a minimum penetration of 30mm into the substrate.

Perimeter channel detail

Typical Ceiling arrangement viewed from below
INSTALLATION INSTRUCTIONS FOR
SEPARATING / PARTY WALLS AC108 & AC208

The following instructions are issued as an aid to the correct installation procedures. Individual site conditions may necessitate variances to these standard instructions. Such cases should be referred to the InstaCoistic Technical Department for approval. All installation and working practices should be in accordance with relevant Codes of Practice, current British Standards and HSE Regulations.

SITE PREPARATION
- If a screed has been applied it must be fully cured before beginning the installation of the floor system
- On concrete floors, a membrane (if required), such as 1200 gauge polythene sheeting, should be installed over all ground floor slabs and new concrete bases above ground level
- Building to be dry and weatherproof
- All flooring materials to be stored in safe dry conditions
- InstaCoistic adhesive and sealant should not be subjected to temperatures of less than 5˚C
- Floor receiving the AC208 system must be level to within 3mm over a 3m run
- Free of all debris and sharp objects
- Loose or creaking floor boards must be screwed down and cracks between boards sealed
- Any acoustic thresholds or plinths must be fitted before laying the AC208 floor system

REQUIRED TOOLING
- Circular saw
- Jigsaw
- Pencil
- Utility knife
- Battery drill
- Countersink bit
- Tape measure

TEST CERTIFICATION AVAILABLE

STEP 1 PERIMETER SUPPORT
1 Fit the perimeter support by stapling or gluing it to the floor. Fix it tight to the perimeter of the room or skirting board. When fitting a system with more than one layer of perimeter support, fix each layer to the previous layer by pinning or stapling every 200mm. (If skirting boards are removed, ensure any damage caused to the plaster or wall finish is made good prior to fitting the system).

STEP 2 DECOUPLING FIBRE
2 Lay the decoupling fibre on the floor (up to, but not on top of the perimeter support) and staple it to the floor along its edges at 1.0 metre intervals as laying proceeds. When laying an InstaCoistic flooring system with more than one layer of decoupling fibre each layer should be laid at 90˚ to the previous layer, and stapled to the floor in turn.

STEP 3 SOUND BARRIER PADS
3 Overlay the decoupling fibre with the sound barrier pads laid at 90˚ to the direction of the decoupling fibre. The hessian-backed sound barrier pads should be laid with the black surface uppermost. They should be laid tight to the perimeter of the room or skirting board and tightly butt jointed together. Any gaps in the sound barrier pads should be sealed with acoustic sealant. (Sound barrier pads should be cut with a utility knife).

STEP 4 T & G OVERLAY BOARDS
4 Fit the overlay boards at 90˚ to the direction of the sound barrier pads with the groove of the overlay board facing towards the perimeter of the room.
- The boards should be laid in a staggered formation.
- Ensure that all joints are a minimum of 150mm apart.
- Maintain an 8mm gap with spacers between the overlay board and the skirting board or the wall.
- Liberally glue all edges of the T & G overlay boards as laying proceeds with InstaCoistic adhesive.
- As laying proceeds, avoid walking on the overlay boards whenever possible.
- To avoid the overlay board creeping, ensure the board is kept tightly in position with wedges between the board and the skirting board (or perimeter of the room), whilst the adhesive sets.

*NOTE: Although the Overlay Boards are suitable to receive vinyl floor covering, final preparation may be necessary to avoid the mirroring-through of the board joints, such as overlaying with hardboard or plywood. Please refer to vinyl manufacturers for further guidance.

STEP 5 SEALING THE PERIMETER
5 When the adhesive has set, remove the spacers and wedges and fill the 8mm gap to the perimeter of the room with InstaCoistic sealant, to the full depth of the overlay board.
The adjustable AS20 & AS28 systems provide wall levelling capabilities. The AS28 gives additional acoustic performance with the inclusion of IN8 acoustic insulation.

- Suitable for masonry walls or stud work
- Minimal loss of room space (minimum 60mm void)
- Anti-flanking walls also available
- Wall straightening system
- Electrical services incorporated

Case Study

Project
Residential upgrade of 19th century building for housing association, including some offices
Cheltenham, Gloucestershire

Construction
Masonry with 100mm timber stud walls with 2 x 12.5mm soundblock both sides

Systems used
AS28 wall system

Testing
Airborne: 33dB $D_{nT,w} + C_{w}$
After: 45dB $D_{nT,w} + C_{w}$
House Conversions

PERFORMANCE DATA – FIELD SOUND TESTS

TEST NO. F26  Acoustic Wall System

- SYSTEM TESTED
  INSTACOUSTIC SYSTEM AS28

- ADDRESS OF TEST
  Edmonstone House, North Place, Cheltenham

- TESTED BY
  noise.co.uk Ltd

- WALL CONSTRUCTION
  100mm Timber Stud with 50mm Gyproc Batts & 2 Layers 15mm Soundblock Either Side

- CEILING CONSTRUCTION
  Lath and Plaster

- TEST RESULTS BEFORE TREATMENT
  “BEFORE” AIRBORNE NOISE (DnT,w + Ctr)
  
  - 7 Bedroom to Office 39 - 6 = 33dB
  - Storage Area to Office 37 - 7 = 30dB

- TEST RESULTS AFTER TREATMENT WITH INSTACOUSTIC SYSTEM AS28
  “AFTER” AIRBORNE NOISE (DnT,w + Ctr)
  
  - 7 Bedroom to Office 50 - 5 = 45dB
  - Storage Area to Office 52 - 4 = 48dB
Intudeck is an economical lightweight product for rapidly and cost-effectively upgrading timber floor constructions to achieve 30-90 minutes fire integrity and insulation.

It is particularly useful in situations where lath and plaster ceilings cannot be disturbed or where occupancy of the floor below does not allow fire upgrading by such means as installing fire rated plasterboard.

Tested to BS 476 Pt 22, Intudeck is easily installed by simple compression fitting and bonding with mastic between existing floor joists. At 1200mm x 600mm it covers most joist centres and requires no steel brackets.

**Intudeck installation**

- Locate and review InstaCoustic Health & Safety notes before commencing work
- Lift sufficient floorboards to enable Intudeck to be installed
- Remove any plugging from the ceiling/floor void and clear dust from the sides of the joists to improve adhesion of the bonding intumastic
- Apply a 10mm bead of intumastic to the side of each joist 35mm from the bottom. If adhesion is difficult, spray the joist with water using a small garden spray
- Measure the gap between joists and cut an Intudeck batt along the 1200mm sides to fit tightly
- Place loosely in position at 45° between joists. Using a timber board to spread the load, ease into final position using gentle foot pressure
- When finally positioned, apply a 5mm bead of intumastic all around the seal and on the butt joints
- Inspect and check work and re-fix all floorboards