Solutions for improved sound insulation in old housing

Dan Hoffmeyer (1), Birgit Rasmussen (2)

(1) DELTA Acoustics, DK; (2) SBi, Danish Building Research Institute, Aalborg University, DK

Improvement of sound insulation – Old housing

In connection with renovation or rebuilding of old housing in Denmark, improved sound insulation should be included as an objective. Projects concerning the possibilities of complying with sound class C in the Danish classification scheme DS 490:2007 have been carried out.

The projects “Better sound insulation in newly renovated homes” focused on old apartment buildings with typical Danish timber floor constructions. For these floor constructions an improvement of approx. 5 dB for the airborne sound insulation and 10 - 15 dB for the impact sound insulation is normally required. Different solutions have been tested in the laboratory as well as in the field during renovation of a block of flats in Copenhagen.

The projects were funded by the Danish Ministry of Housing and Building & The Danish Landowners Investment Fund, 1999-2006. Information about the projects and results are given on: www.ejendomsviden.dk/nabostoj

Example of solution for improved floor construction: 3D and construction drawing. Timber flooring on joists with elastic supports on iron mounting across beams. Pugging replaced by plasterboard.

Example of a solution for sound class C for old housing with typical Danish timber floor construction. Measurement results from building acoustic laboratory measurements and field measurements in an old apartment building before and after renovation.

Timber floors
Typical Danish timber floor
Solution with joists on iron mounting

<table>
<thead>
<tr>
<th>R_w</th>
<th>R'_w</th>
<th>L'n,w</th>
<th>L'_{n,w}</th>
<th>R_w</th>
<th>R'_w</th>
<th>L'n,w</th>
<th>L'_{n,w}</th>
</tr>
</thead>
<tbody>
<tr>
<td>52 dB</td>
<td>65 dB</td>
<td>61 dB</td>
<td>56 dB</td>
<td>52 dB</td>
<td>58 dB</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Example of a solution for improved floor construction: Typical Danish timber floor construction with pugging replaced by plasterboard.

Examples of different solutions tested in the laboratory and/or in the apartment building, some fulfilling sound class C, some only class D