

DIN EN 12354-5:2023-08 (E)

Building acoustics - Estimation of acoustic performance of buildings from the performance of elements - Part 5: Sounds levels due to the service equipment

| Contents | | Page |
|---|--|-------------|
| European foreword | | 4 |
| 1 | Scope | 5 |
| 2 | Normative references | 5 |
| 3 | Terms and definitions | 6 |
| 4 | Relevant quantities | 6 |
| 4.1 | General | 6 |
| 4.2 | Quantities to express building performances (output quantities) | 6 |
| 4.2.1 | General | 6 |
| 4.2.2 | Relation between quantities | 7 |
| 4.3 | Quantities to express product performances (input quantities) | 7 |
| 4.3.1 | General | 7 |
| 4.3.2 | Sources of sound | 7 |
| 4.3.3 | Transmission of sound | 8 |
| 5 | Calculation models | 8 |
| 5.1 | General principles | 8 |
| 5.2 | Airborne sound transmission through building constructions | 9 |
| 5.2.1 | General | 9 |
| 5.2.2 | Source in receiving room | 10 |
| 5.2.3 | Source in another room | 10 |
| 5.3 | Structure-borne sound transmission through building constructions | 11 |
| 5.3.1 | General | 11 |
| 5.3.2 | General case | 12 |
| 5.3.3 | Case with receiver mobility much lower than the source mobility | 14 |
| 5.4 | Accuracy | 16 |
| 6 | Application of models | 17 |
| 6.1 | General | 17 |
| 6.2 | Equipment involving internal airborne transmission | 17 |
| 6.2.1 | General | 17 |
| 6.2.2 | Source airborne sound power | 18 |
| 6.2.3 | Indirect airborne sound transmission through duct system | 19 |
| 6.3 | Equipment involving internal fluid-borne and structure-borne transmissions | 19 |
| 6.3.1 | General | 19 |
| 6.3.2 | Water supply installations | 20 |
| 6.3.3 | Water-heating systems | 26 |
| 6.3.4 | Waste water installations | 27 |
| 6.4 | Equipment involving internal structure-borne transmission only | 27 |
| 6.4.1 | General | 27 |
| 6.4.2 | Prediction procedure | 28 |
| Annex A (normative) List of symbols (main text and normative annexes) | | 29 |
| Annex B (normative) Sound levels at low frequencies | | 32 |
| Annex C (normative) Additional path by path prediction methods | | 34 |

| | | |
|--|--|----|
| C.1 | Introduction | 34 |
| C.2 | Method considering each transmission path ij globally | 34 |
| C.3 | Method considering each transmission path ij characterized by the flanking sound reduction index | 34 |
| Annex D (informative) Non-stationary sources | | 36 |
| D.1 | Descriptors used in field measurements | 36 |
| D.2 | Prediction of "Slow" and "Fast" time weighted descriptors for quasi-stationary and non-stationary sources | 37 |
| Annex E (informative) Input quantities for estimating source sound powers along duct systems and sound transmission between rooms through duct systems | | 38 |
| E.1 | Introduction | 38 |
| E.2 | Input quantities | 38 |
| E.3 | List of symbols | 42 |
| Annex F (informative) Estimation of receiver and source mobilities, and isolator on-site performance | | 43 |
| F.1 | General | 43 |
| F.2 | Receiver mobility | 43 |
| F.3 | Source mobility | 46 |
| F.4 | Isolator performance | 49 |
| Annex G (informative) Calculation examples | | 51 |
| G.1 | General | 51 |
| G.2 | Cases with receiver mobility much lower than the source mobility (heavy structures) | 51 |
| G.3 | General Case (lightweight structures) | 57 |
| G.4 | Calculation examples of Single Number Quantities (SNQ) applicable to products characterized using EN 14366-1 | 68 |
| Bibliography | | 72 |