

DIN 1946-6 Beiblatt 1:2025-06 (E)

Ventilation and air conditioning - Part 6: Ventilation for residential buildings - General requirements, requirements for design, construction, commissioning and handover as well as maintenance; Supplement 1: Sample calculations for selected ventilation systems

Contents

Page

Foreword	6
1 Scope	7
2 Normative references	7
3 Terms and definitions.....	7
4 General	7
5 Building data.....	14
5.1 Single-family house	14
5.2 Semi-detached house	16
5.3 Apartment in apartment building with bathrooms with external wall.....	18
5.4 Apartment in apartment building with bathrooms with internal wall	19
5.5 Student studio apartment in apartment building with bathroom with internal wall	21
6 Remarks on the calculation	22
6.1 Calculation rules.....	22
6.2 Building data.....	22
6.3 Necessity of ventilating measures (see DIN 1946-6:2019-12, Clause 4)	23
6.4 Determining ventilation measures (see DIN 1946-6:2019-12, Clause 5)	23
6.5 Determining the effective and required outdoor air flow rates $q_{v,ges}$ (see DIN 1946-6:2019-12, Clause 6).....	23
6.6 Determination of air flow rates due to ventilation measures $q_{v,LtM}$ (see DIN 1946-6:2019-12, Clause 7 and Clause 8)	23
6.6.1 General	23
6.6.2 Form for designing ventilation components according to specific rooms.....	24
6.6.3 Additional form for designing according to specific rooms and arranging the ventilation units.....	26
6.6.4 Additional form for designing and arranging internally mounted air transfer devices	27
6.7 Separate ventilation spaces (zones) of a dwelling unit (see DIN 1946-6:2019-12, 9.2).....	27
6.8 A ventilation space of a dwelling unit with several overlapping ventilation measures (see DIN 1946-6:2019-12, 9.3).....	28
6.9 Hybrid ventilation (see DIN 1946-6:2019-12, 9.4).....	28
7 Examples of natural ventilation according to DIN 1946-6:2019-12, Clause 7.....	28
7.1 Cross ventilation — Moisture-prevention ventilation — Semi-detached house	28
7.2 Cross ventilation — Moisture-prevention ventilation — Apartment building with bathrooms with external walls.....	34
7.3 Shaft ventilation — Reduced ventilation — Apartment building with bathrooms with external wall	40
8 Examples of fan-assisted ventilation according to DIN 1946-6:2019-12, Clause 8.....	46
8.1 Exhaust air system — Central fan ventilation system — Apartment building with bathroom with external wall.....	46
8.2 Exhaust air system — Central fan ventilation system — Single-family house	51
8.3 Exhaust air system — Central fan ventilation system — Apartment building with bathroom with internal wall	59
8.4 Exhaust air system — Single-room ventilation units — Student studio apartment.....	64
8.5 Supply air system — Central fan ventilation system — Single-family house.....	70

8.6	Supply air system — Single-room ventilation units — Apartment building with bathrooms with external wall	77
8.7	Supply air/exhaust air system — Central fan ventilation system — Single-family house.....	83
8.8	Supply/exhaust air system — Single-room ventilation unit continual — Single-family house	90
8.9	Supply/exhaust air system — Single-room ventilation unit continual with connection to neighbouring rooms — Apartment building with bathrooms with external wall	98
8.10	Supply/exhaust air system — Single-room ventilation unit alternating — Single-family house	104
9	Examples of combined ventilation systems according to DIN 1946-6:2019-12, Clause 9	113
9.1	Supply/exhaust air system and cross ventilation separate — Single-room ventilation units alternating — Single-family house.....	113
9.2	Supply/exhaust air system and cross ventilation separate — Single-room ventilation units continual — Apartment building with bathrooms with external wall.....	123
9.3	Supply/exhaust air system — Single-room ventilation units continual with overlapping ventilation according to DIN 18017-3 — Apartment building with bathrooms with internal wall.....	131
9.4	Supply/exhaust air system — Single-room ventilation units alternating with overlapping ventilation according to DIN 18017-3 — Apartment building with bathrooms with internal wall.....	138
9.5	Cross ventilation with ventilation system according to DIN 18017-3 (case 1) — Apartment building with bathrooms with internal wall	146
9.6	Cross ventilation with ventilation system according to DIN 18017-3 (case 2) — Apartment building with bathrooms with internal wall	152
9.7	Hybrid ventilation system — Shaft ventilation with extract air fan — Apartment building with bathrooms with external wall	158
Annex A	(informative) Examples of air flow rates for heat load calculation in accordance with DIN/TS 12831-1	164
A.1	General.....	164
A.2	Example 8.2: Exhaust air system — Central fan — Single-family house.....	164
A.3	Example 8.7: Supply/exhaust air system — Central fan — Single-family house	167
	Bibliography	170

Figures

Figure 1	— Ventilation systems and ventilation levels to be designed according to DIN 1946-6:2019-12, Figure 2	8
Figure 2	— Single-family house — Floor plan ground floor	15
Figure 3	— Single-family house — Floor plan upper storey	15
Figure 4	— Semi-detached house — Floor plans (Ground floor, upper storey, top floor).....	17
Figure 5	— Apartment in apartment building — Floor plan with bathroom with external wall.....	18
Figure 6	— Apartment in apartment building — Floor plan with bathroom with internal wall.....	20
Figure 7	— Student studio apartment in apartment building — Floor plan with bathroom with internal wall	21
Figure 8	— Floor plans for the semi-detached house (ground floor, upper storey, top storey).....	29

Figure 9 — Floor plan of a single-storey apartment in an apartment building.....	35
Figure 10 — Floor plan of a single-storey apartment in an apartment building	41
Figure 11 — Floor plan of an apartment in an apartment building with ventilation components for exhaust air systems — central.....	46
Figure 12 — Floor plan of the single-family house (top: ground floor, bottom: upper storey) with ventilation components for exhaust air system — central	53
Figure 13 — Floor plan of an apartment in an apartment building with ventilation components for exhaust air systems — central.....	59
Figure 14 — Floor plan of a student studio apartment in an apartment building with ventilation components for exhaust air systems — decentral.....	65
Figure 15 — Floor plan of the single-family house (top: ground floor, bottom: upper storey) with ventilation components for supply air system — central	71
Figure 16 — Floor plan of a single-storey apartment in an apartment building with ventilation components for supply air systems — decentral	78
Figure 17 — Floor plan of the single-family house (top: ground floor, bottom: upper storey) with ventilation components for supply/exhaust air system — central fan ventilation system	84
Figure 18 — Floor plan of the single-family house (top: ground floor, bottom: upper storey) with ventilation components for supply/exhaust air system — Continual single-room ventilation units.....	91
Figure 19 — Floor plan of an apartment in an apartment building with ventilation components for the supply/exhaust air system — Continual single-room ventilation units with connection to neighbouring rooms.....	98
Figure 20 — Floor plan of the single-family house (top: ground floor, bottom: upper storey) with ventilation components for supply/exhaust air system — (Pairs of) Alternating single- room ventilation units	105
Figure 21 — Floor plan of the single-family house (top: ground floor, bottom: upper storey) with ventilation components for the combined ventilation system with separate ventilation spaces comprising a supply/exhaust air system — Alternating single-room ventilation units and cross ventilation	114
Figure 22 — Floor plan of an apartment in an apartment building with ventilation components for the combined ventilation system with separate ventilation spaces comprising a supply/exhaust air system — Continual single-room ventilation units and cross ventilation.....	124
Figure 23 — Floor plan of an apartment in an apartment building with ventilation components for the combined ventilation system with several overlapping ventilation measures comprising a supply/exhaust air system — Continual single-room ventilation units and ventilation according to DIN 18017-3.....	132

Figure 24 — Floor plan of an apartment in an apartment building with ventilation components for the combined ventilation system with several overlapping ventilation measures comprising a supply/exhaust air system — Alternating single-room ventilation units and ventilation according to DIN 18017-3	139
Figure 25 — Floor plan of an apartment in an apartment building with ventilation components for a ventilation system and cross ventilation system (moisture-prevention ventilation is ensured via the ventilation system).....	146
Figure 26 — Floor plan of an apartment in an apartment building with ventilation components for a ventilation system and cross ventilation system (moisture-prevention ventilation is not ensured via the ventilation system)	152
Figure 27 — Floor plan of an apartment in an apartment building with ventilation components for shaft ventilation and exhaust air system	158
Figure A.1 — Floor plan ground floor with air flow rates	166
Figure A.2 — Floor plan upper storey with air flow rates	166
Figure A.3 — Floor plan ground floor with air flow rates	168
Figure A.4 — Floor plan upper storey with air flow rates	169

Tables

Table 1 — Description of the calculation examples.....	9
Table 2 — Single-family house — Basic data for determining air flow rates	15
Table 3 — Semi-detached house — Basic data for determining air flow rates	17
Table 4 — Apartment in apartment building — Basic data for determining air flow rates	19
Table 5 — Apartment in apartment building — Basic data for determining air flow rates	20
Table 6 — Student studio apartment in apartment building — Basic data for determining air flow rates	21
Table A.1 — Air flow rates.....	165
Table A.2 — Air flow rates.....	167