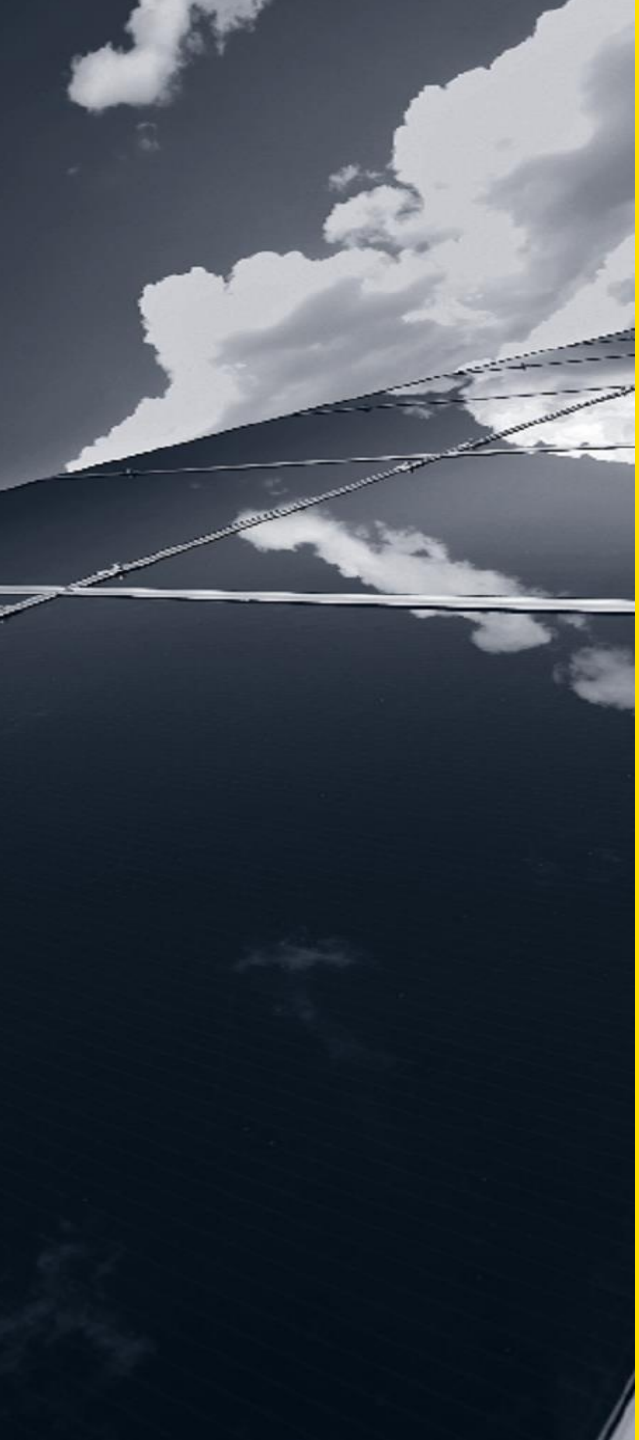

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EE measures and Implementation - Trainings Program for Construction Companies and Supervisors

Air tightness

Building envelope air tightness
Impact of air and wind tightness

- Minimization of energy losses
- Prevention of condensation in structure
- Prevention of airflows in insulation layer
- Prevent the entry of air pollutants
- Prevent cold floors on ground floor levels
- Assure proper function of ventilation systems
- Assure proper impact of the insulation on the construction elements
- Air and wind tightness accounts as a hidden defect

Building envelope air tightness

Massive construction:

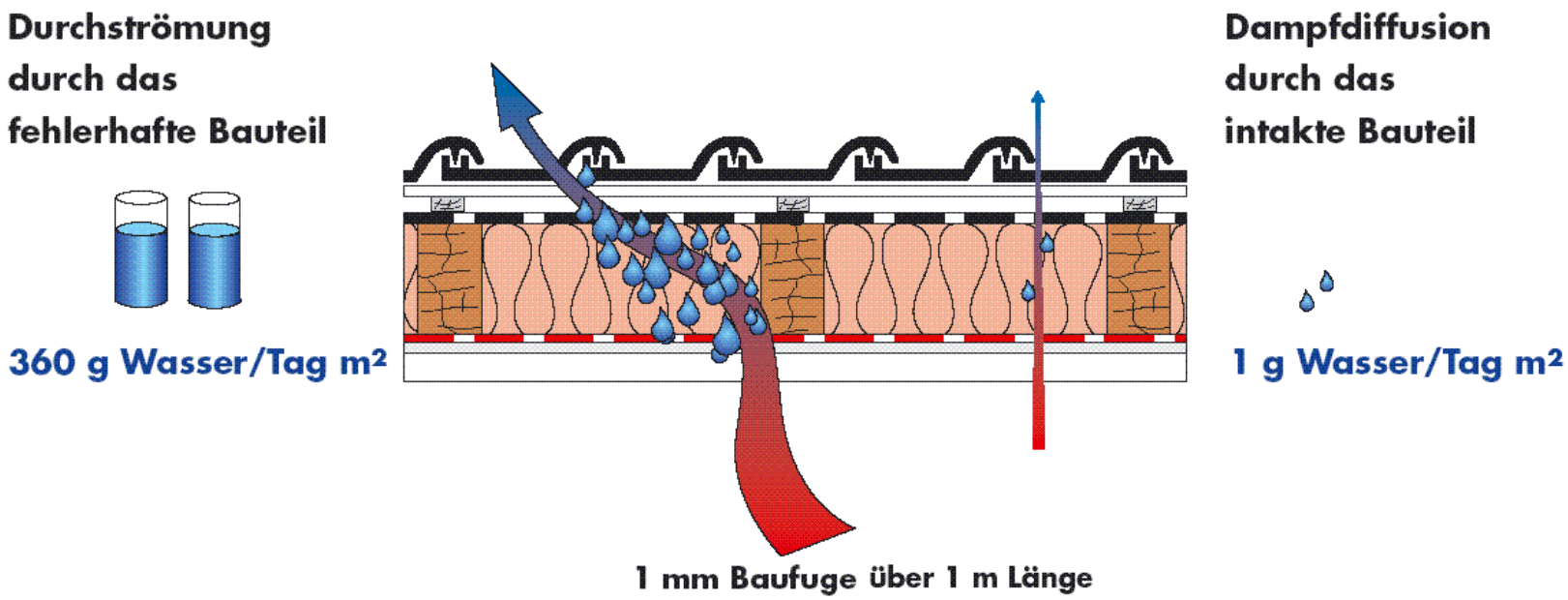
- Airtight layer: Interior plaster, Masonry alone is not airtight
- Hot spots: Window connections, Doors; Bituminous sealing, floors slabs-masonry, feedthroughs

Lightweight construction:

- Critical points: vapour barrier, airflow tight folium on the inner side of the building slabs (e.g. Gypsum boards, OSB-boards) with filled or glued joints
- Critical points: glued joinst, especially in corners; connections to windows, doors, feedthroughs

Building envelope air tightness

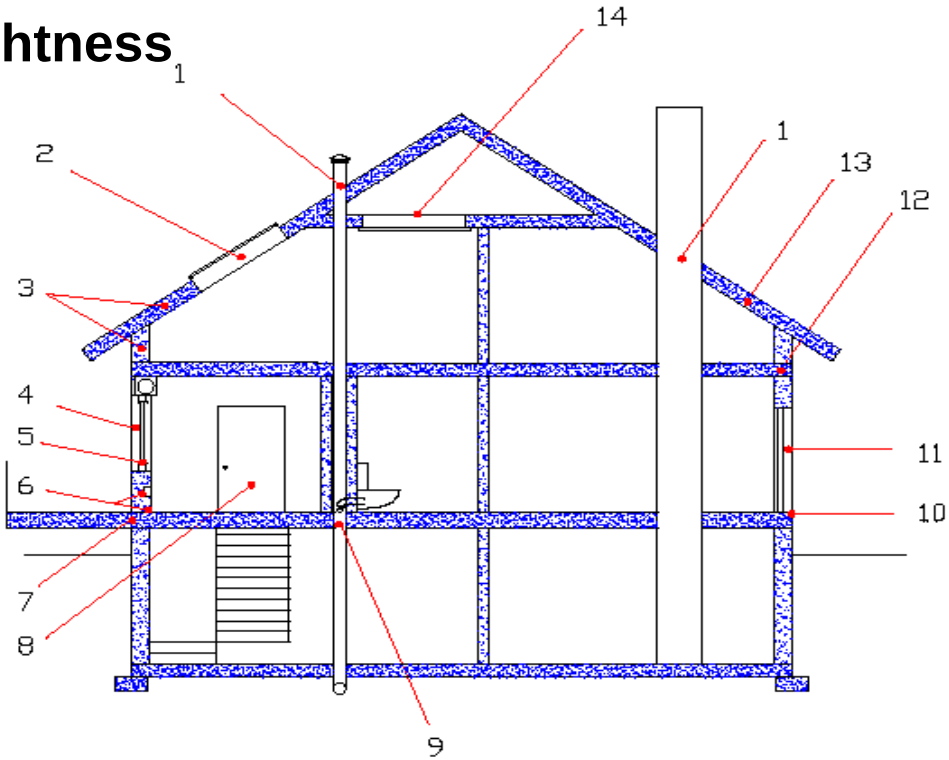
Losses due to 1mm grout



Quelle: Energieagentur NRW

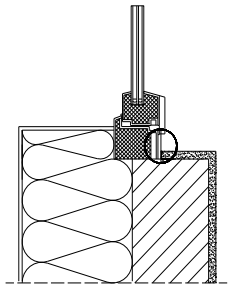
Building envelope air tightness

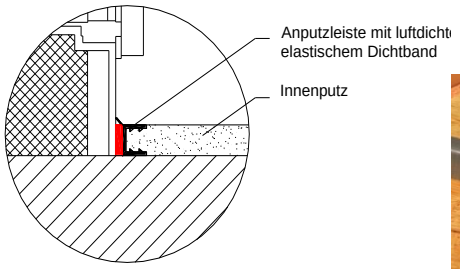
Critical points

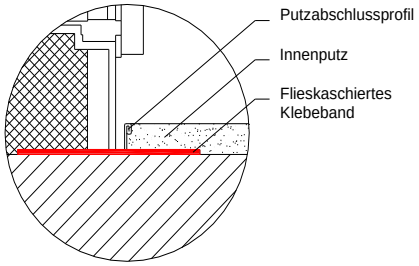


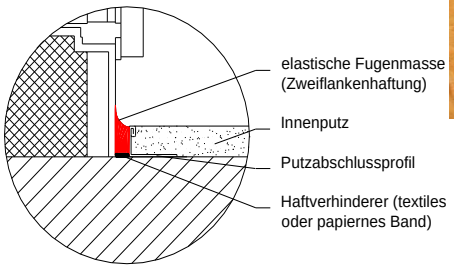
1 Rohrdurchdringung Dach (Sanitär, Lüftungsanlagen)
2 Dachflächenfenster / Anschlüsse
3 Sparren, Anschlüsse / Ortgang
4 Fensterblendrahmenanschlußfuge Mauerwerk
5 Fensterflügelrahmenanpressung auf Blendrahmen
6 Luftdichtigkeit der Außenwand
7 Nach Außen durchlaufende Durchdringungen
8 Boden– und umlaufende Dichtung Kellertür
9 Durchdringung von Sanitärrohren u. sonst. Install.
10 Bodendichtung Tür
11 Außentür Blendrahmen Mauerwerk
12 Auflager von Holzbalkendecken
13 Anschluß Dämmstoff / Sparrenflanken
14 Einstiegsluke Spitzboden

Building envelope air tightness









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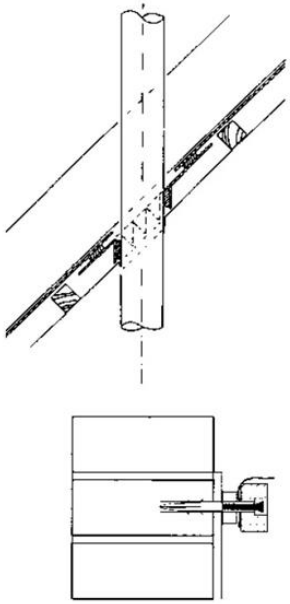
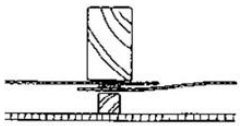
Building envelope air tightness

Building envelope air tightness
Examples

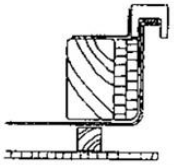


Mauerwerksanschluss durch Dichtband und Anpressplatte

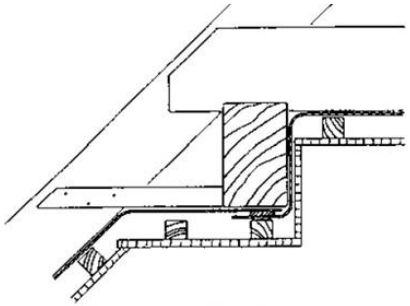
Entlüftungsrohr: Dichtung durch Passstück (als Manschette ausgebildet)



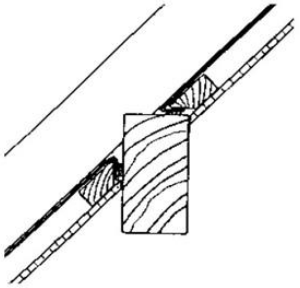
Stoß von Luft-dichtungsbahnen



Anschluss an Dach-flächenfenster



Anschluss Dachschräge an Spitzboden durch Dichtungsbahnverlauf unterhalb der Kehlbalken

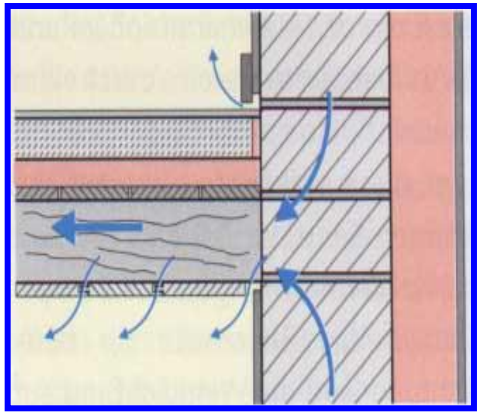


Anschluss an sichtbare Pfetten mit Dichtband oder Kleber und Anpresslatte

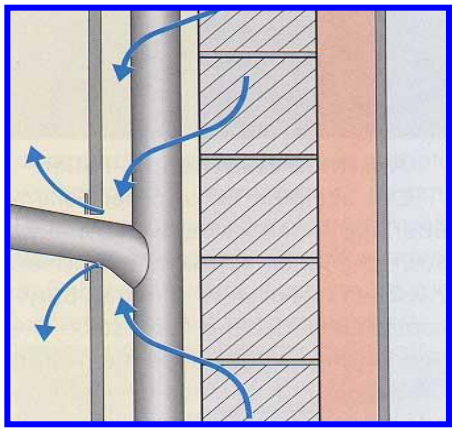
Quelle: Energieagentur NRW

Building envelope air tightness
Examples

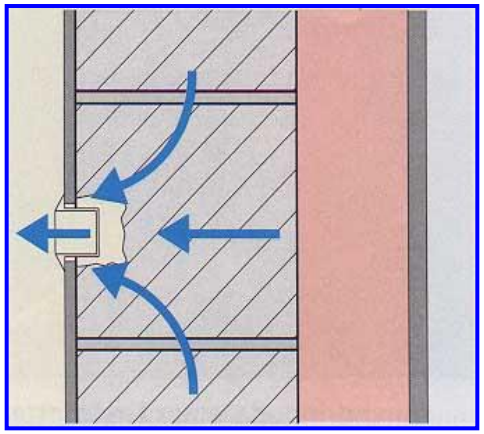
Holzbalkendecke gemauerte Wand



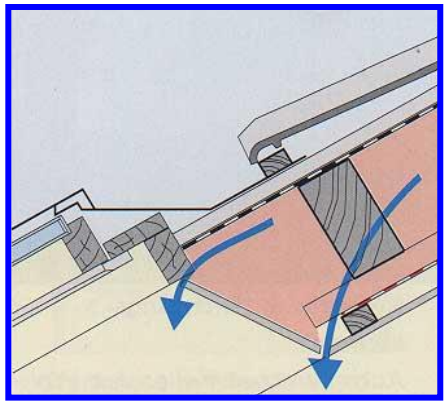
Installationen vor gemauerter Außenwand



Steckdosen in Massivwand



Dachfenster

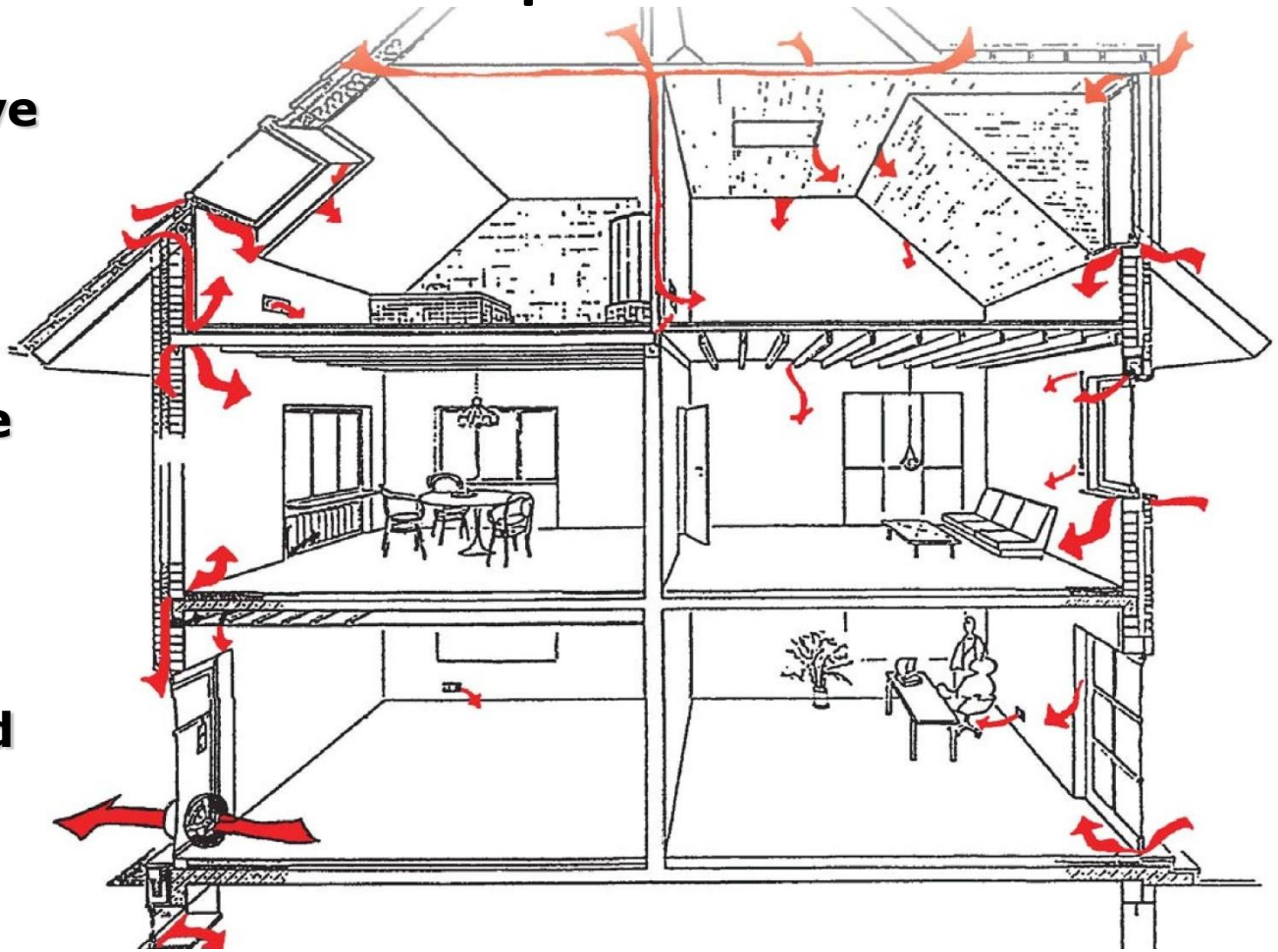


Building envelope air tightness
Examples

50 Pa Negative pressure: Air will be sucked in

50 Pa positive pressure: Air will leak

Air volume is measured and air exchange calculated



Quelle: Energieagentur NRW

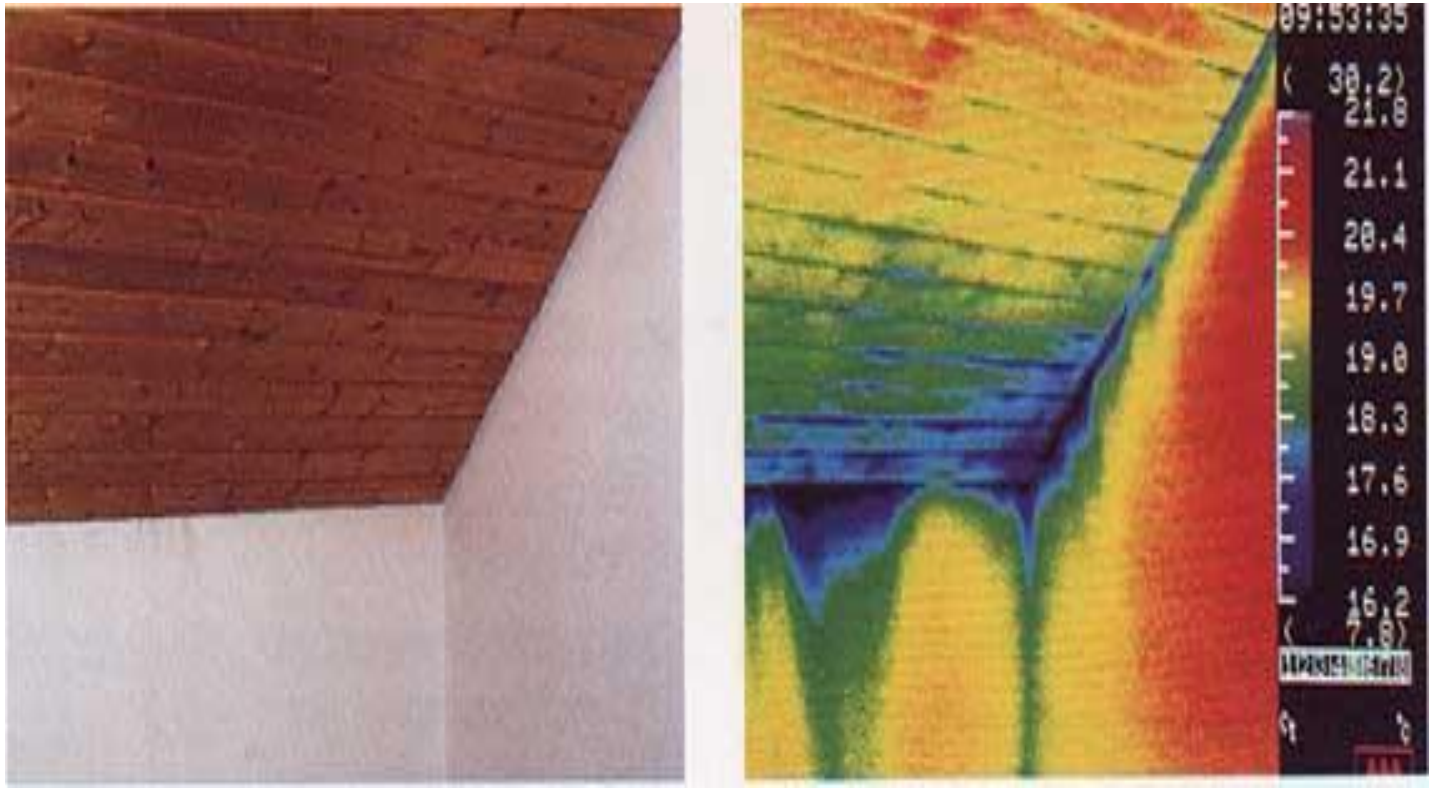
Building envelope air tightness
Measurements using pressure differential

Blower Door Test results in measuring:
conveyed volume flow rate V_{50}

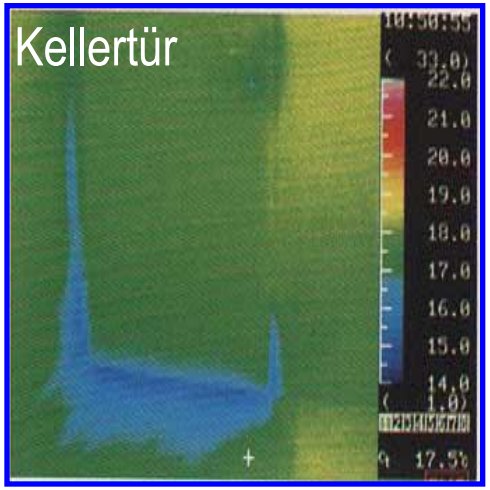
From that we calculate:
n_{50} air exchange rate pro h at 50 Pa

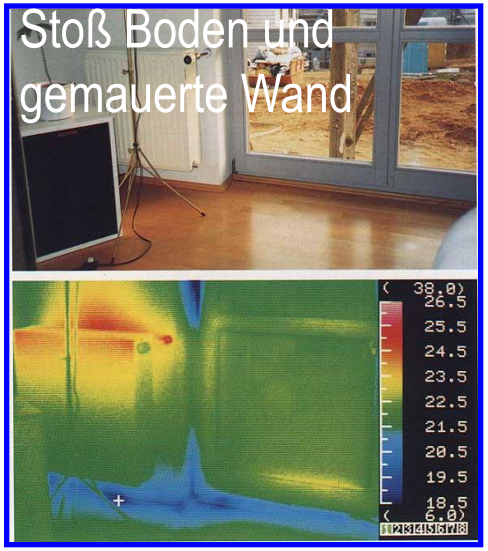
Source: 17&4 Organisationsberatung

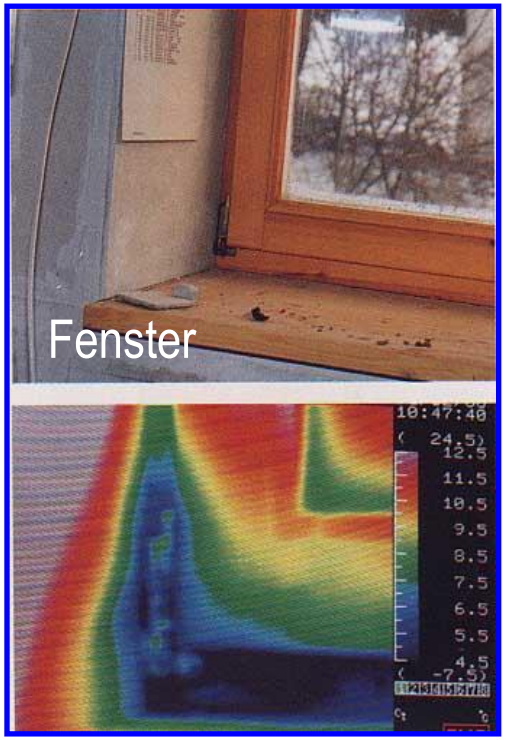
Building envelope air tightness
Examples



Building envelope air tightness
Measurements using pressure differential







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We are looking forward
to the future.
Wherever!
Whenever!
With you.

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