

Dr. Becker Gábor

Introduction to Building Constructions

External walls, facade coverings

www.epszerk.bme.hu



Budapest University of Technology and Economics
Faculty of Architecture  Department of Building Constructions

task (function): external vertical separation

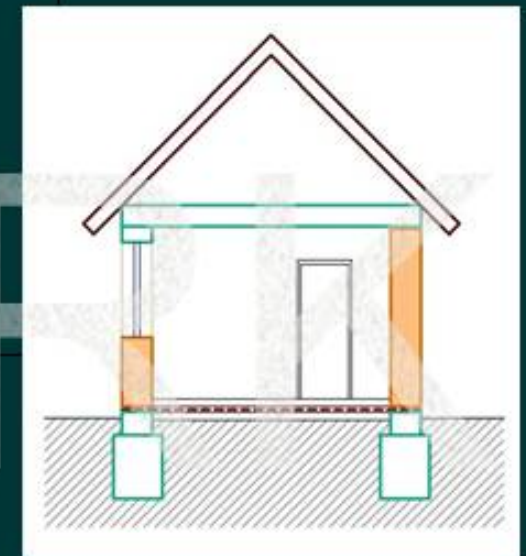
effect → requirements → **structure**

effects → requirements → adequate qualities in the
external wall structure

- ↓
- stability
 - heat protection (thermal ins., heat dampening)
 - adequate vapour barrier qualities
 - noise protection, noise reduction
 - water insulation
 - air insulation
 - protection against mechanical effects
 - fire proofing
 - aesthetics: external-internal

other requirements:

must resist sunlight (heat, UV), wind, dust, soiling, chemical effects (corrosion), must be hygienic (may be cleaned, dry)



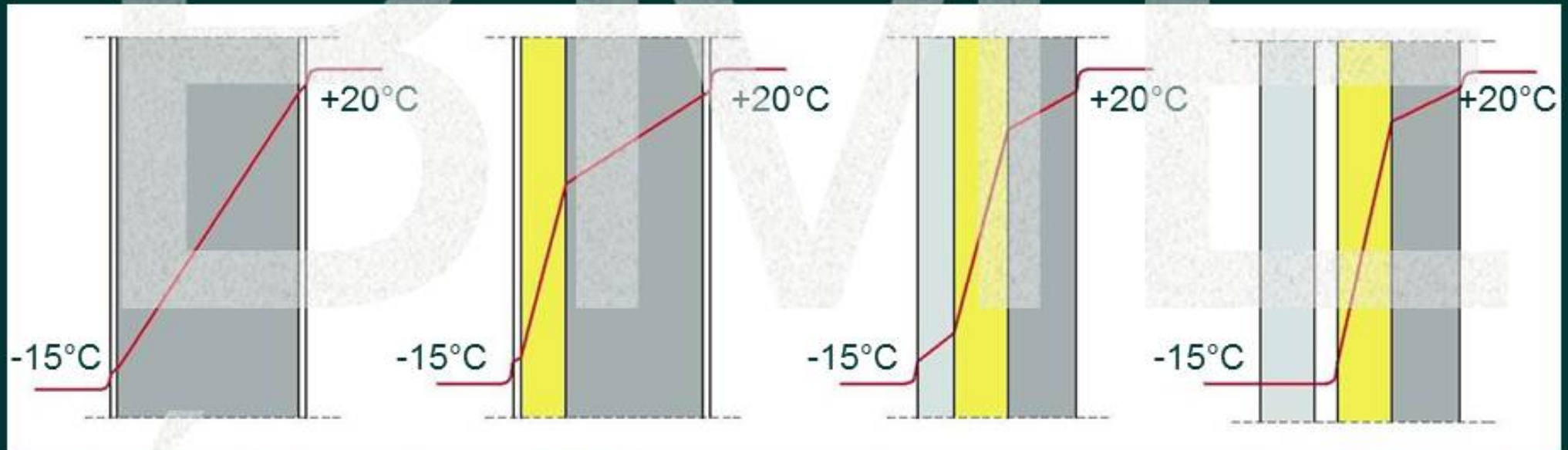
extrenal wall functions, requiriements
external walls, facade coverings, door and windows

external wall layer structure



single unit

composite



uniform

- surface finish (coveing)
- self support wall
- surface finish

layered

- surface finish (coveing)
- thermal insulation
- self support wall
- surface finish

core insulation

- surface finish (coveing)
- thermal insulation
- self support wall

ventilated

- surface finish (coveing)
- air gap
- thermal insulation
- self support wall

external wall layer structure
external walls



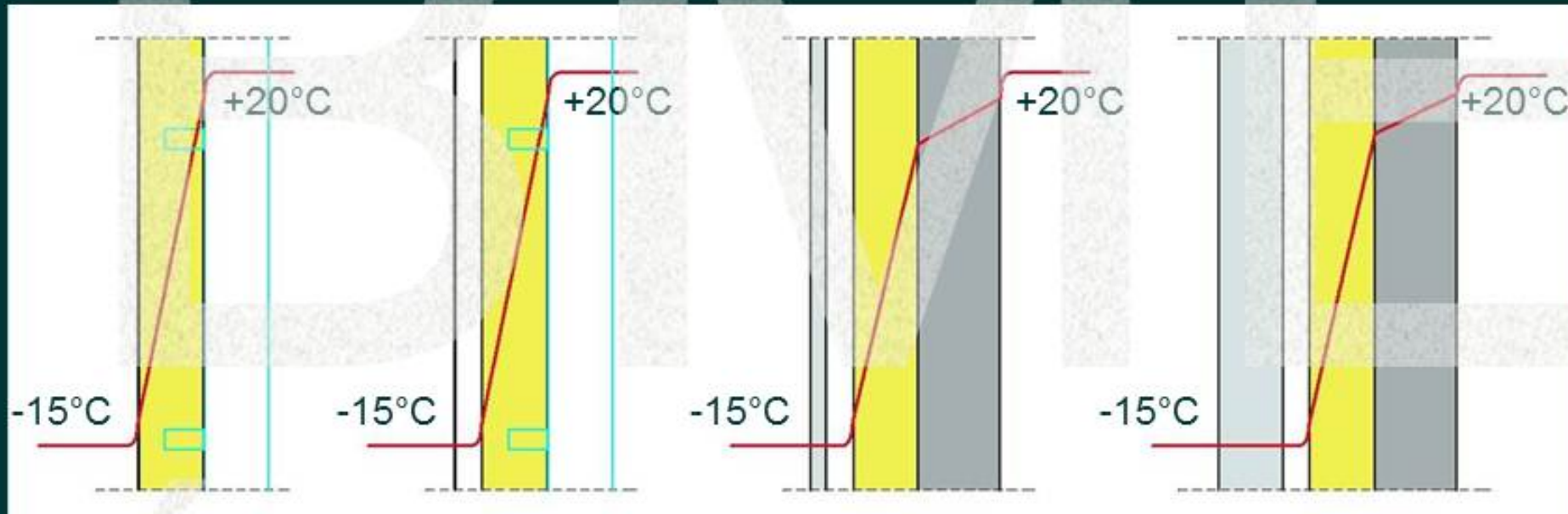


external wall layer structure
external walls



assembled wall (frame str.)

composite: facade cover systems



core insulation sandwich panel

- external surface
- thermal insulation
- internal surface
- support frame

composite, ventilated

- external surface
- air gap
- thermal insulation
- internal surface
- support frame

light facade covers

- surface finish (coveing)
- air gap
- thermal insulation
- self support wall

heavy facade covers

- surface finish (coveing)
- air gap
- thermal insulation
- self support wall



assembled walls, facade coverings
external walls – construction of external walls



assembled walls, facade coverings
external walls – construction of external walls



core insulated external wall
external walls – single unit walls





brick facade covering



lábazati falon



the covering of the insulated wall



steel console

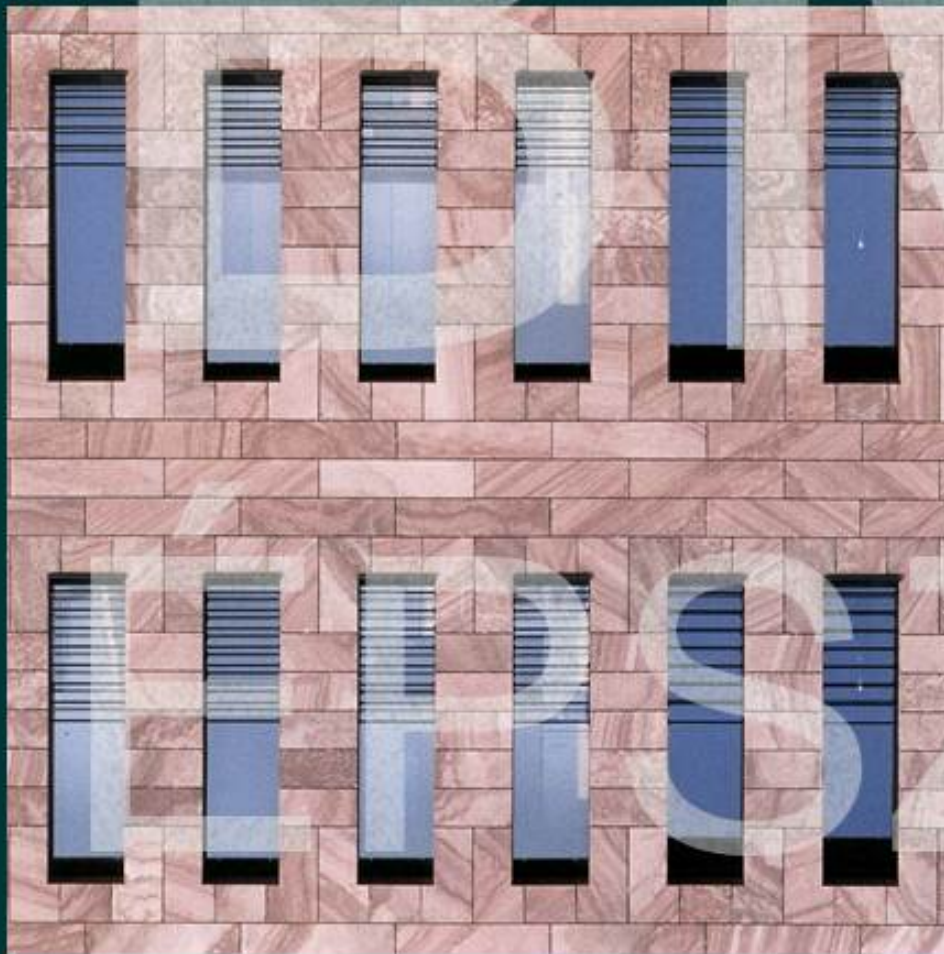


th. insulation, air gap, connector, brick



brick facade covering

external walls – facade coverings – heavy facade coverings



stone facade coverings

external walls – facade coverings – heavy facade coverings



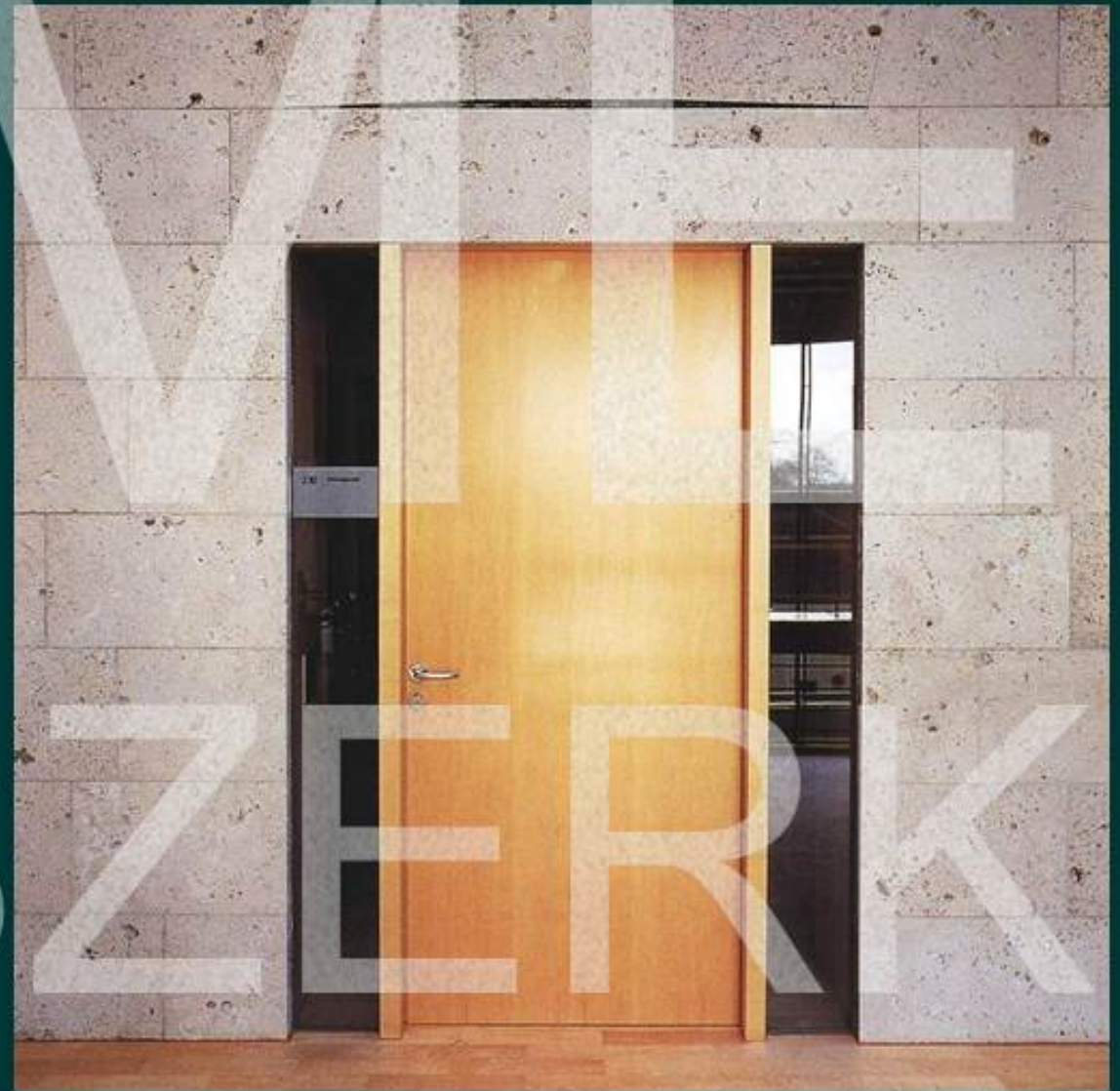
affixing
the cover



stone sheet facade coverings

external walls – facade coverings – heavy facade coverings





stone sheet facade coverings

external walls – facade coverings – heavy facade coverings





aluminum
covering



th. insulation,
structure



cassette
covering

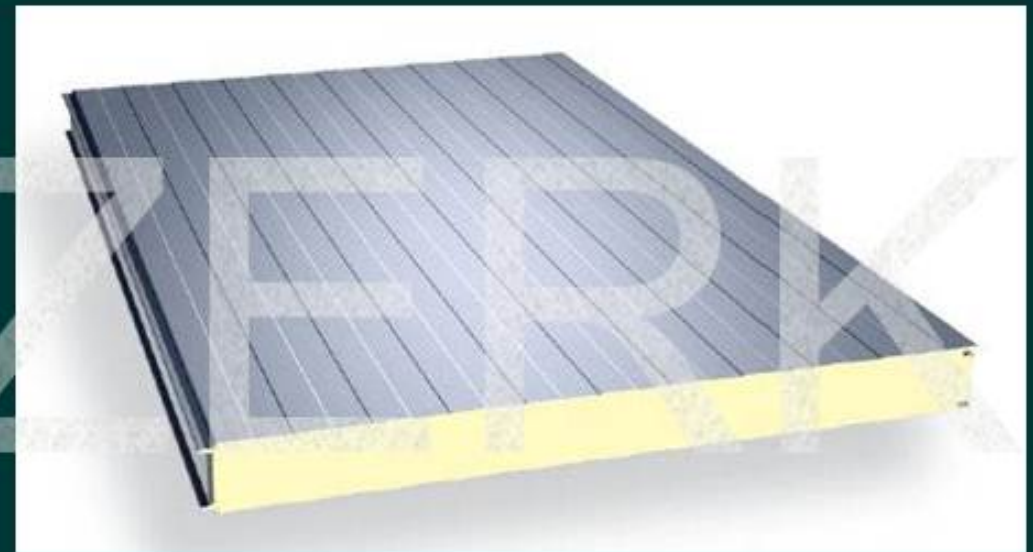
steel sheet facade coverings

external walls – facade coverings – light weight facade coverings





covering sheet (cassette)



sandwich panel



steel sheet facade coverings and sandwich panels
external walls – facade coverings – light weight facade coverings

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Doors and windows

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doors and windows: opening + closure

structures intended for a specific connection of open spaces with the intended level of separation: doors, windows

windows

always part of the external wall → requirements as of the wall + must open and must transmit light

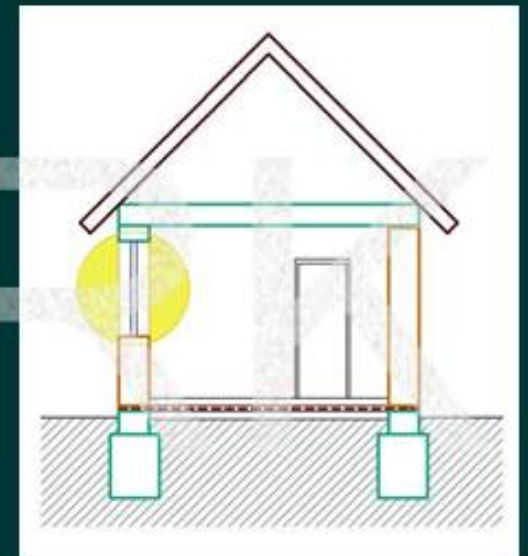
task (function): dual (must open to and enclose)

must allow

- the influx of natural light, sunlight
- ventilation
- a view to the outside

must prevent

- wind
- rain, snow entry
- dust
- overheating
- overcooling
- noise is to be kept out
- privacy
- burglary
- falling out



door and window structures, windows

external walls, facade coverings, **doors and windows**



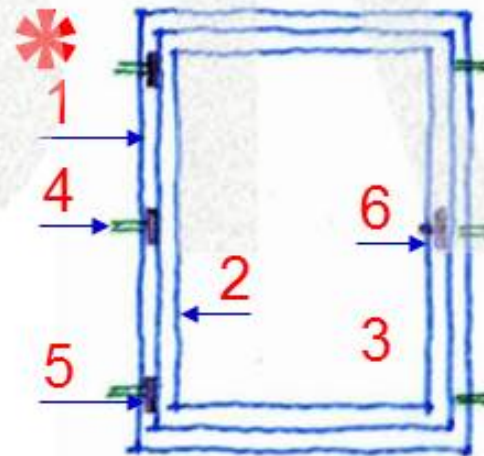
quality:



- thermal insulation
- air seal
- noise insulation

window components

1. frame
2. panel
3. glass
4. frame fixations
5. hinges etc.
6. knoba and lock



befogadó
fal

rögzítés
tömítés
takarás

tok

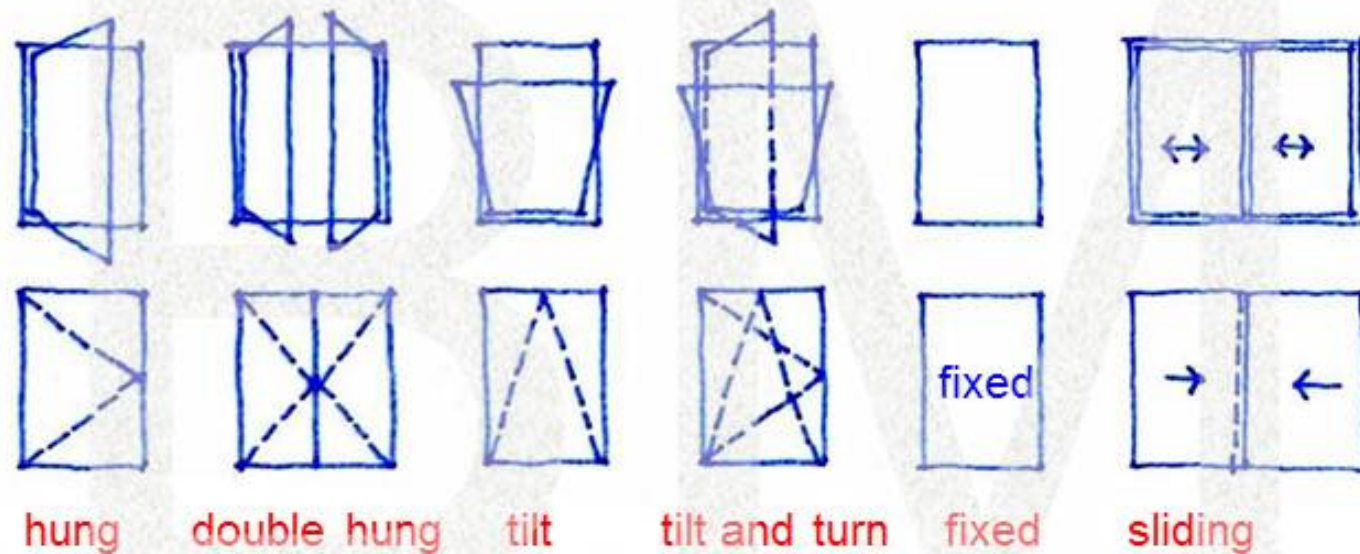
vasalat
tömítés

szárny

ék
ágyazás
tömítés
rögzítés

üveg

window components
doors and windows - windows



sliding
windows



BN
window groups
according to material

wood

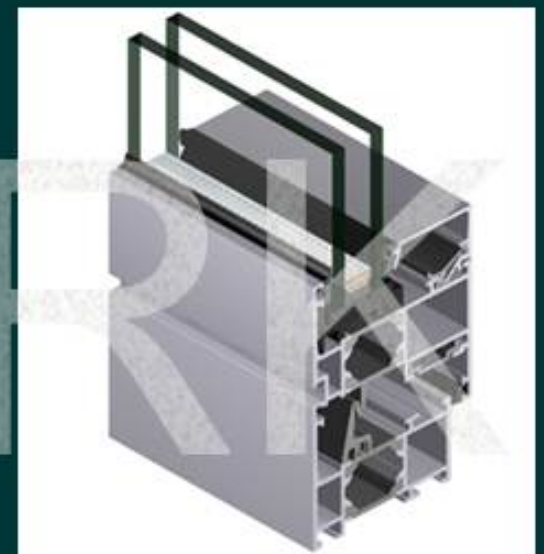
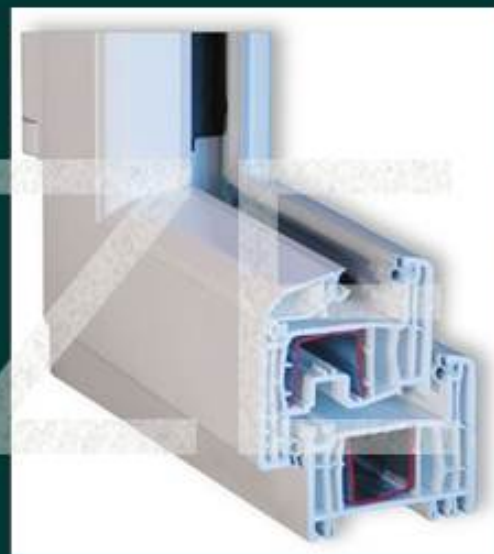
plastic

- PVC

metal

- steel
- aluminum

combination



window materials
doors and windows - windows

doors, gates

gate: „bigger”, heavier

task (function): dual (to open and to close)

open: architectural and / or traffic connection between spaces

closed: a specific level of separation of the connected spaces → moving parts!

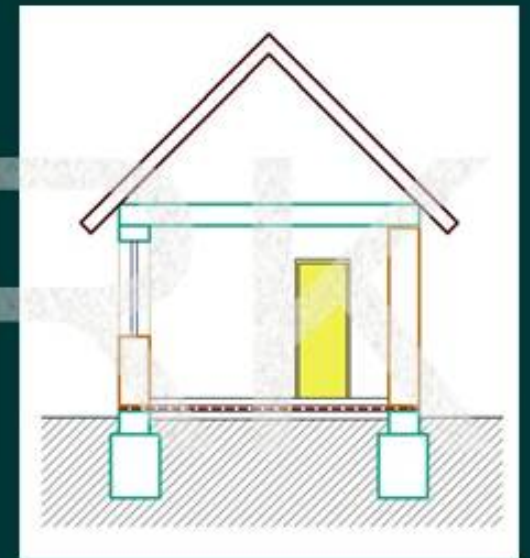
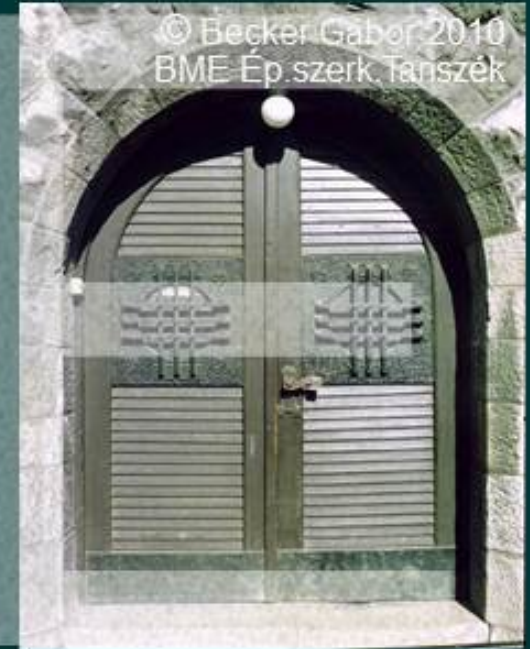
size: depends on the intended use –the type and amount of through traffic,

part of the outside or inside wall → requirements as of external/internal wall + opening, (+light inlet)

categories (various levels of requirement)



- external entry door (wind, water)
- internal entry door (air seal, thermal insulation, anti-burglar protection)
- internal door (noise separation, use req., fire)



doors, gates

external walls, facade coverings, **doors and windows**

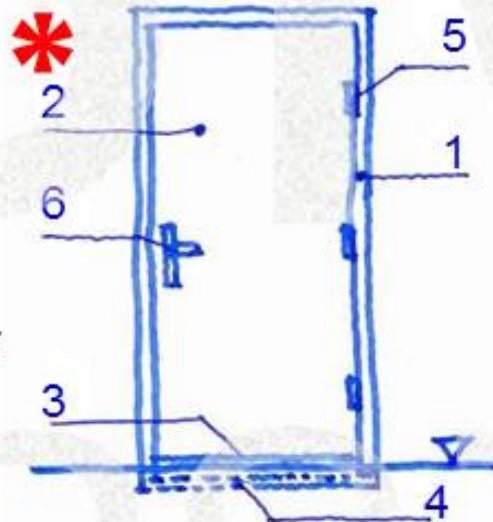
quality :



- mechanical resistance
- noise insulation
- air seal
- thermal insulation

door
components

- 1 frame
- 2 panel
- 3 step or sill
- 4 frame connector
- 5 hinges
- 6 lock and knob



befogadó
fal

rögzítés
tömítés
takarás

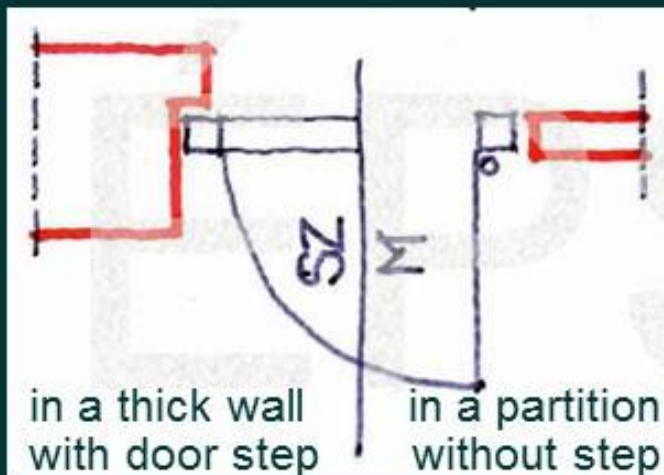
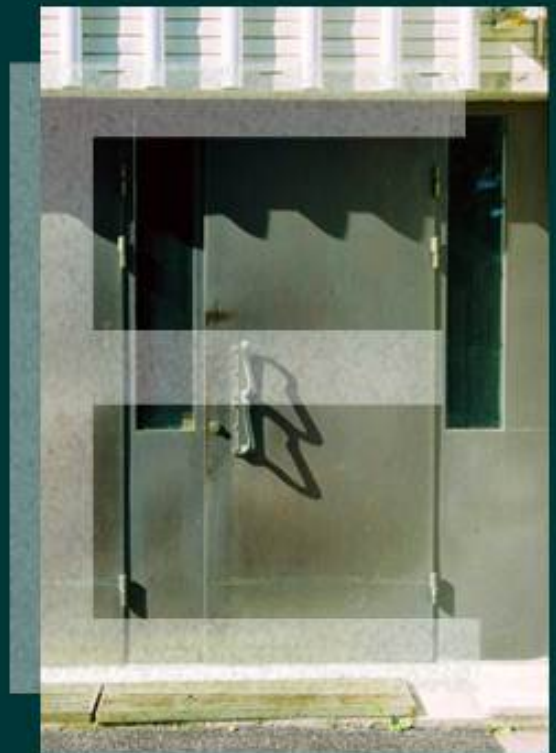
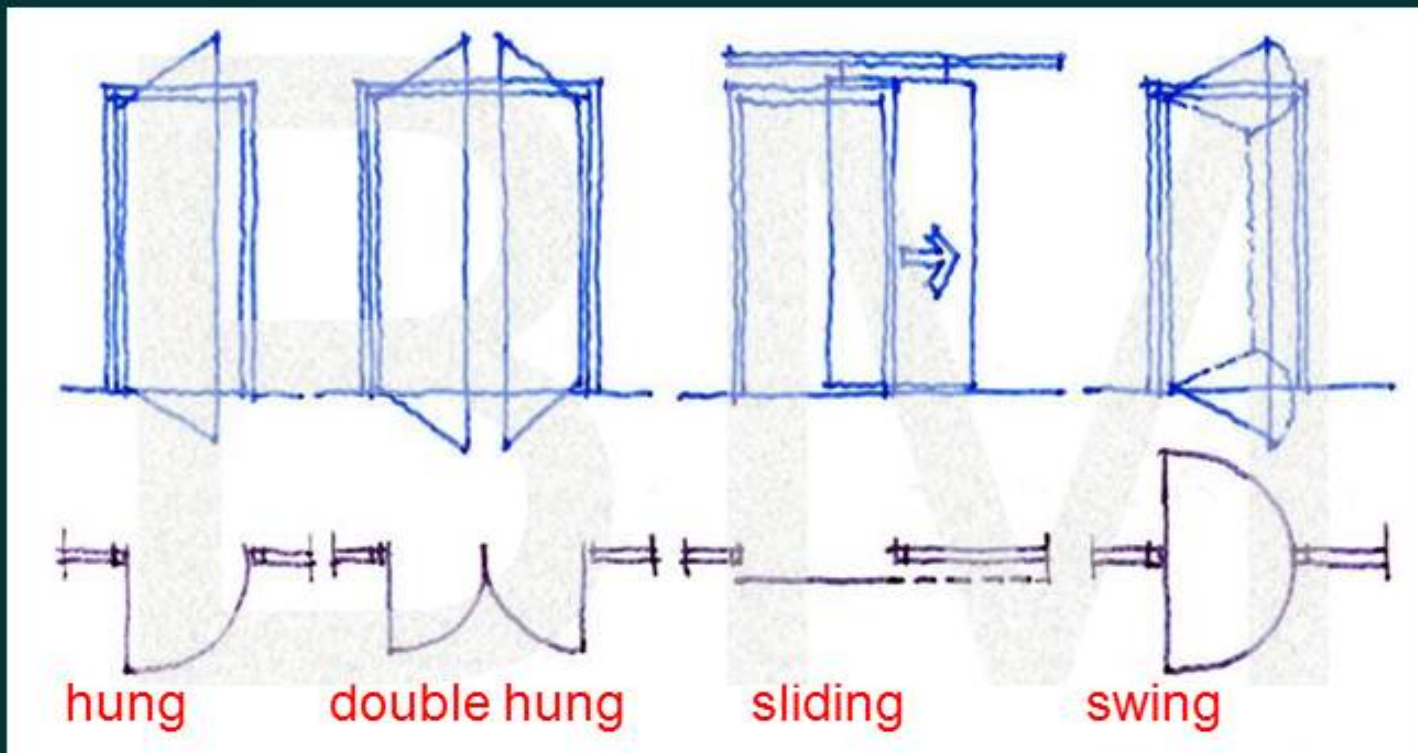
tok

vasalat:
pánt,zár
(tömítés)

szárny



door components
doors and windows – doors, gates



floor plan indications
(opening direction)



door operation
doors and windows – doors, gates

door groupings according to
materials' selection

wood, artificial wood

full panel



metal

- steel

- aluminum

plastic

glass

combination

deep glass



door materials

doors and windows – doors, gates

external walls

task (function): external vertical separation

external wall composition

- **single unit**: homogenous, layered, core insulated
- **double unit**: ventilated facade coverings
 - light and heavy coverings
- **assembled walls**

doors and windows

dual function: to connect and to separate

windows

- window components
- methods of operation
- materials selection: wood, plastic, metal, combined

doors, gates

- door components
- methods of operation
- materials selection: wood, (plastic), metal, glass, combined

summary

external walls, facade coverings, door and windows

