BRNO UNIVERSITY OF TECHNOLOGY
VYSOKÉ UČENÍ TECHNICKÉ V BRNĚ

FACULTY OF CIVIL ENGINEERING
FAKULTA STAVEBNÍ

INSTITUTE OF BUILDING STRUCTURES
ÚSTAV POZEMNÍHO STAVITELSTVÍ

HOTEL

6.3 – HEAT TRANSFER OF WINDOWS AND DOORS

DIPLOMA THESIS
DIPLOMOVÁ PRÁCE

AUTHOR — Bc. Richard Sasko
AUTOR PRÁCE

SUPERVISOR — Ing. KAREL STRUHALA
VEDOUCÍ PRÁCE

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General procedure for calculating the Uw heat transfer coefficient

Heat transfer coefficient Uw:

$$Uw = (Ag \times Ug + Af \times Uf + lg \times \Psi g) / (Ag + Af) \ [W / (m2K)]$$

where:
Ag ... area of glazing [m2]
Af ... frame area [m2]
Ug ... heat transfer coefficient of glazing [W / (m2K)] Uf ...
heat transfer coefficient of the frame [W / (m2K)] lg ...
total visible glazing [m]
Ψ g ... linear heat transfer factor caused by combined heat.
recommended value of heat transfer coefficient [W / (m2K)]

Rating according to standard:
Uw ≤ Un, rc [W / (m2K)]
Uw ≤ Un, rq [W / (m2K)],
where:
Un, rc ... effects of glazing, spacing frame and frame [W / (mK)] Un,
rq ... set point of heat transfer coefficient [W / (m2K)]

Calculation of the heat transfer Uw

Window W1

Window EUROOKNO TTK KOMFORT PLUS, wood-aluminum frame, tilting and opening system, triple glazing, all-round fitting, 2 safety points

b = 1.5 m
h = 1.5 m
A = b×h = 1.5×1.5 = 2.25 m2 Ag
= 2.00 m2
lg = 2.80 m
Ψg = 0.06 W/(mK)
Ug = 0.50 W/(m2K)
Af = 0.25 m2
Uf = 0.79 W/(m2K)
Uw = (Ag×Ug + Af×Uf + lg×Ψg)/(Ag + Af)

Uw = (2.00×0.50 + 0.25×0.79 + 2.80×0.06)/(2.00+ 0.25)

Uw = 0.607 W/(m2K) ≤ Un,rc = 1,20 W/(m2K) → **Satisfactory**
≤ Un,rq = 1,50 W/(m2K) → **Satisfactory**

Window W2
Window EUROOKNO TTK KOMFORT PLUS, wood-aluminum frame, tilting and opening system, triple glazing, all-round fitting, 2 safety points

b = 1.0 m
h = 0.5 m
A = b×h = 1.0×0.5 = 0.5 m^2 Ag
= 0.42 m^2
lg = 1.60 m
Ψg = 0.06 W/(mK)
Ug = 0.50 W/(m2K)
Af = 0.08 m^2
Uf = 0.79 W/(m2K)
Uw = (Ag×Ug + Af×Uf + lg×Ψg)/(Ag + Af)

Uw = (0.42×0.50 + 0.08×0.79 + 1.60×0.06)/(0.42+ 0.08)

Uw = 0.726 W/(m2K) ≤ Un,rc = 1,20 W/(m2K) → **Satisfactory**
≤ Un,rq = 1,50 W/(m2K) → **Satisfactory**

Door D1
Entrance door, TTK KOMFORT PLUS, wood-aluminum frame, tilting and opening system, triple glazing, all-round fitting, 3 safety points, aluminium threshold

b = 2.00 m
h = 2.02 m
A = b×h = 2.00×2.02 = 4.04 m2
Ag = 0.40 m^2
lg = 1.00 m
Ψg = 0.06 W/(mK)
Ug = 0.50 W/(m2K)
Af = 0.225 m^2
Uf = 0.79 W/(m2K)
Uw = (Ag×Ug + Af×Uf + lg×Ψg)/(Ag + Af)

Uw = (0.40×0.50 + 0.225×0.79 + 1.00×0.06)/(0.42+ 0.225)

Uw = 0.679 W/(m2K) ≤ Un,rc = 1,20 W/(m2K) → **Satisfactory**
≤ Un,rq = 1,50 W/(m2K) → **Satisfactory**

Conclusion

All windows and doors satisfy the requirements.