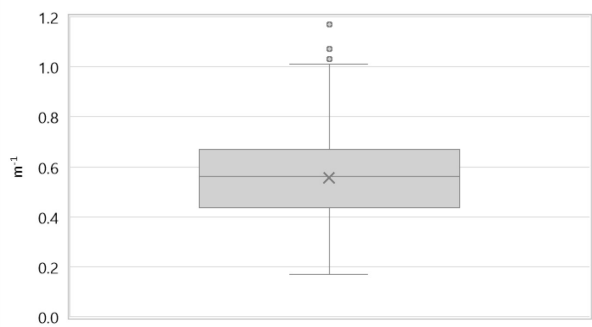


| Region: | Lombardy | | | | | | Archetype code: RES_APPBLOCK_1991-2005_E_LOM | |
|---|--|---|-----------------------|-----------------------------|--------------------|---------------------|--|---------------------|
| Building category: | Residential buildings – Apartments (in multifamily blocks) | | | | | | | |
| Period of construction: | 1991-2005 | | | | | | | |
| Climatic zone: | E | Number of records: | | 16 | | | | |
| Description (the codes associated with walls and slabs refer to the structures described in UNI/TR 11552:2014): External walls: double layer of hollow bricks (8 cm + 12 cm) with insulated air gap (cod. MCV02). Roof slabs: reinforced brick-concrete slab (22 cm) plus uninsulated concrete screed (4 cm) (cod. SOL04) | | | | | | | Data sources: CURIT database (30%) Municipal database (23%) Visual inspection (16%) Others (31%) # | |
| | Data | Symbol | Unit of measure | Mean value | Standard deviation | Q1 (first quartile) | Median value | Q3 (third quartile) |
| BUILDING GEOMETRY | Number of floors | n_f | - | 6.94 | 3.62 | 4.00 | 5.00 | 8.75 |
| | Gross height | H_g | m | - | - | - | - | - |
| | Footprint area | $A_{\text{footprint}}$ | m ² | - | - | - | - | - |
| | Heated gross floor area | $A_{H,g}$ | m ² | - | - | - | - | - |
| | Heated net floor area | $A_{H,n}$ | m ² | - | - | - | - | - |
| | Heated gross volume | $V_{H,g}$ | m ³ | - | - | - | - | - |
| | Heated net volume | $V_{H,n}$ | m ³ | - | - | - | - | - |
| | Compactness ratio | $A_{\text{env}}/V_{H,g}$ | m ⁻¹ | 0.56 | 0.19 | 0.44 | 0.56 | 0.67 |
| | WWR – North orientation | WWR_N | - | - | - | - | - | - |
| | WWR – South orientation | WWR_S | - | - | - | - | - | - |
| | WWR – East orientation | WWR_E | - | - | - | - | - | - |
| | WWR – West orientation | WWR_W | - | - | - | - | - | - |
| | Window to useful floor area ratio | A_{wi}/A_{use} | - | - | - | - | - | - |
| ENVELOPE | Roof type | Reinforced brick-concrete slab medium insulation: 100% | | | | | | |
| | U-value of the roof | $U_{fi,up}$ | W/(m ² ·K) | - | - | - | - | - |
| | External walls type | Hollow brick masonry, high insulation: 36%; Hollow brick masonry, medium insulation: 36%; Hollow brick masonry, low insulation: 21%; Hollow brick masonry: 7% | | | | | | |
| | U-value of the wall | U_{wl} | W/(m ² ·K) | 0.65 | 0.27 | 0.47 | 0.51 | 0.78 |
| | Slab on ground floor type | - | | | | | | |
| | U-value of the floor | $U_{fi,lw}$ | W/(m ² ·K) | - | - | - | - | - |
| | Windows type | - | | | | | | |
| | U-value of the windows | U_W | W/(m ² ·K) | 2.09 | 0.79 | 1.30 | 2.06 | 2.80 |
| Shading system type | Roller blinds: 87%; Shutter: 13% | | | | | | | |
| GAINS and VENTILATION | Occupancy density * | O_c | person/m ² | UNI EN 16798-1 - Table A.19 | | | | |
| | Lighting power density * | W_L | W/m ² | UNI EN 16798-1 - A.8.3 | | | | |
| | Equipment power density * | W_A | W/m ² | UNI EN 16798-1 - A.8.3 | | | | |
| | Type of ventilation | Natural: 100% | | | | | | |
| | Air exchange rate * | n | h ⁻¹ | 0.30 | 0.00 | 0.30 | 0.30 | 0.30 |
| THERMAL SYSTEMS | Heating system type | Autonomous: 56%; Centralized: 44% | | | | | | |
| | Heating generator | Traditional boiler: 57%; Condensing boiler: 36%; Heat exchanger of district heating: 7% | | | | | | |
| | Daily operating time of the heating system * | t_H | h | 14.00 | 0.00 | 14.00 | 14.00 | 14.00 |
| | Energy carrier | Natural gas: 85%; Electricity: 15% | | | | | | |
| | Heating emission sub-system | Radiators: 67%; Radiant panels 33% | | | | | | |
| | Cooling system type | Air-cooled chiller: 100% | | | | | | |
| | Daily operating time of the cooling system * | t_c | h | - | - | - | - | - |
| | Cooling emission sub-system | Multisplit: 100% | | | | | | |
| | DHW system type | Autonomous, coupled with heating: 56%; Centralized, coupled with heating: 38%; District heating: 6% | | | | | | |
| | DHW generator | Natural gas boiler: 94%; District heating: 6% | | | | | | |
| # Local database (13%), CENED database (ACE) (11%), Standards (4%), Expert Assumption (2%), Energy audits (1%) * These values were not available in the considered sources, and are thus derived from UNI EN Standards | | | | | | | | |

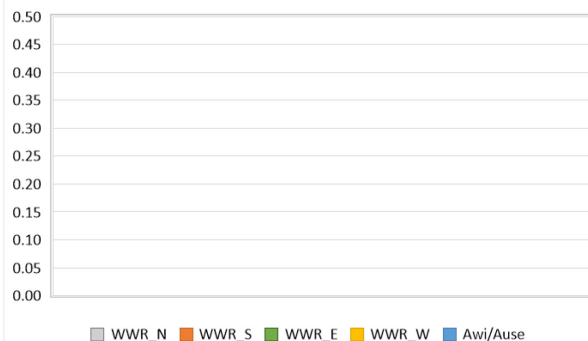
| | | |
|-------------------------|--|---|
| Region: | Lombardy | Archetype code: RES_APPBLOCK_1991- 2005_E_LOM |
| Building category: | Residential buildings – Apartments (in multifamily blocks) | |
| Period of construction: | 1991-2005 | |
| Climatic zone: | E | |
| Number of records: | | 16 |

Numerical variables – GEOMETRY

COMPACTNESS RATIO

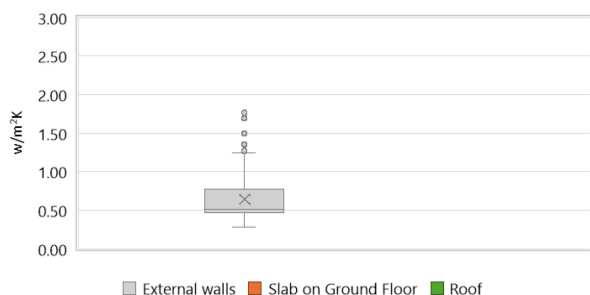


WINDOW TO WALL RATIO

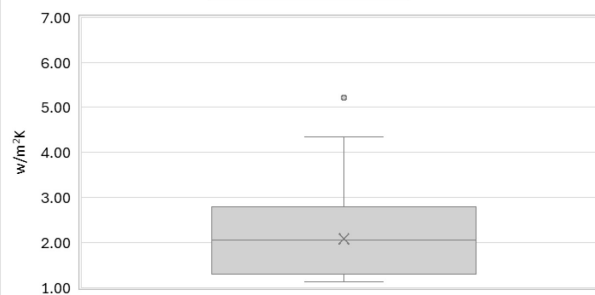


Numerical variables – ENVELOPE

OPAQUE BUILDING COMPONENTS U-VALUE

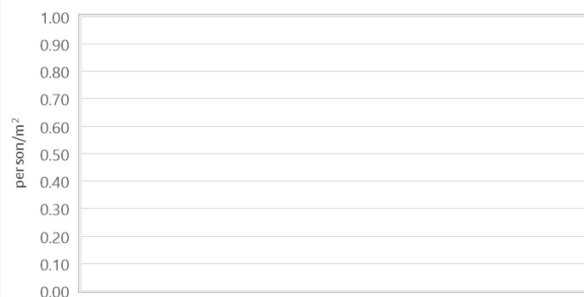


WINDOW U-VALUE



Numerical variables – GAINS, VENTILATION and SYSTEMS USAGE

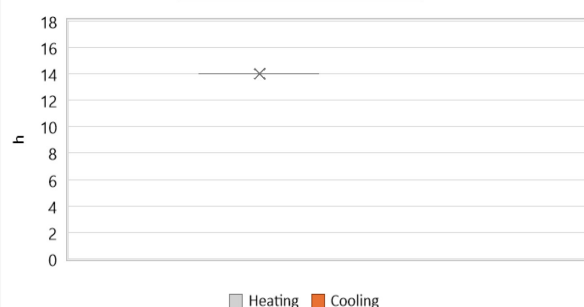
OCCUPANCY DENSITY



INTERNAL GAINS POWER DENSITY



DAILY OPERATING TIME

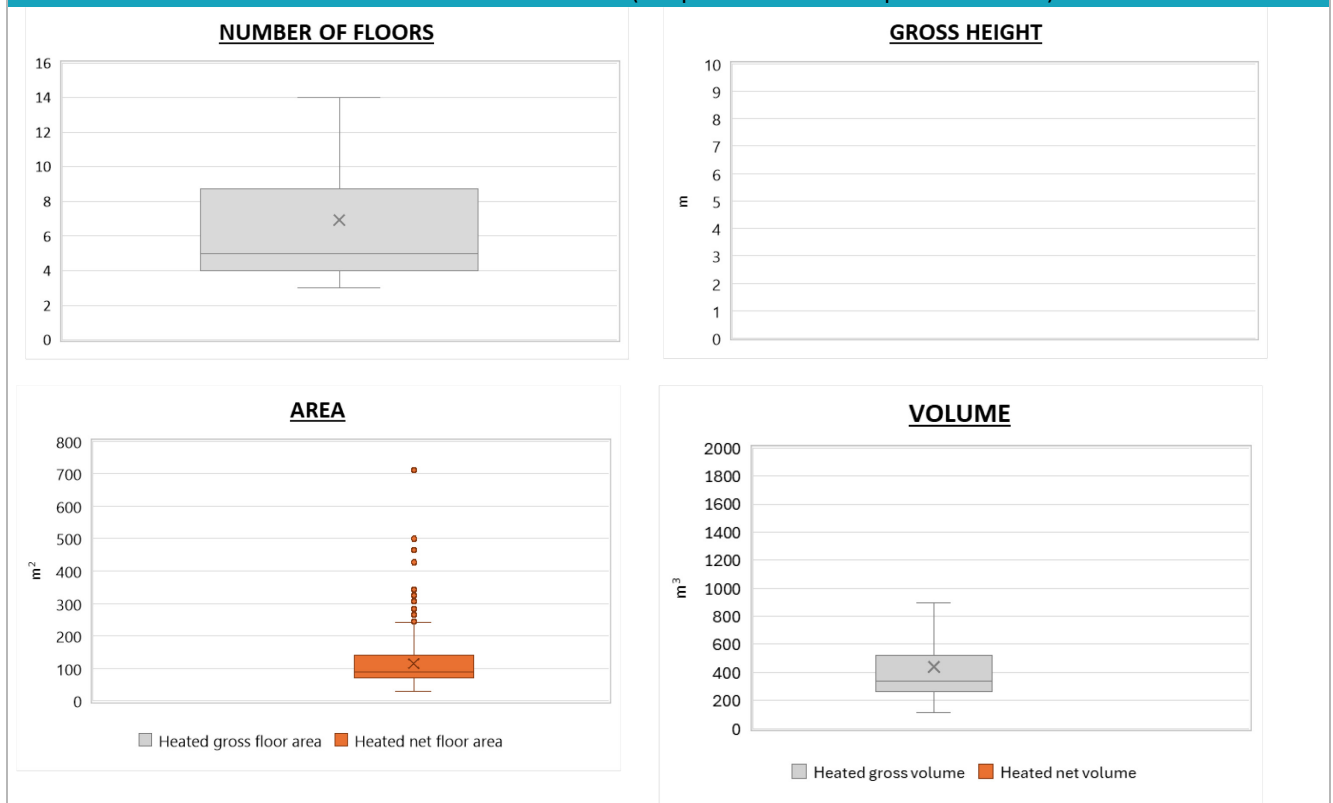


| | | | | |
|-------------------------|--|--------------------|----|---|
| Region: | Lombardy | | | Archetype code: RES_APPBLOCK_1991- 2005_E_LOM |
| Building category: | Residential buildings – Apartments (in multifamily blocks) | | | |
| Period of construction: | 1991-2005 | | | |
| Climatic zone: | E | Number of records: | 16 | |

| ADDITIONAL DATA | | | | | | | | |
|-------------------------|---------------------------|---------------------------------|-----------------|---|--------------------|---------------------|--------------|---------------------|
| | Data | Symbol | Unit of measure | Mean value | Standard deviation | Q1 (first quartile) | Median value | Q3 (third quartile) |
| GEOMETRY: apartments | Inter-storey height | H_n | m | - | - | - | - | - |
| | Heated gross floor area | $A_{H;g}$ | m ² | - | - | - | - | - |
| | Heated net floor area | $A_{H;n}$ | m ² | 115.28 | 75.56 | 71.55 | 88.30 | 140.24 |
| | Heated gross volume | $V_{H;g}$ | m ³ | 440.84 | 294.52 | 264.55 | 337.28 | 524.35 |
| | Heated net volume | $V_{H;n}$ | m ³ | - | - | - | - | - |
| THERMAL SYSTEMS | Heating efficiency or COP | $\eta_{H;gen}$ or $COP_{H;gen}$ | - | This value has to be retrieved from suitable datasheets | | | | |
| | Total heating power * | $P_{H;gen}$ | kW | 139.45 | 135.30 | 25.60 | 32.00 | 275.10 |
| | Cooling efficiency or EER | $\eta_{C;gen}$ or $EER_{C;gen}$ | - | This value has to be retrieved from suitable datasheets | | | | |
| | Total cooling power * | $P_{C;gen}$ | kW | 81.25 | 195.29 | 3.80 | 6.70 | 177.00 |
| | Temperature of DHW | ϑ_W | °C | 40.00 | 0.00 | 40.00 | 40.00 | 40.00 |
| | DHW system power * | $P_{W;gen}$ | kW | 139.55 | 135.16 | 25.90 | 32.20 | 275.10 |

* These values refer to the apartment scale

Additional data: GEOMETRY (the plots refer to the apartment scale)



| | | |
|-------------------------|--|---|
| Region: | Lombardy | Archetype code: RES_APPBLOCK_1991- 2005_E_LOM |
| Building category: | Residential buildings – Apartments (in multifamily blocks) | |
| Period of construction: | 1991-2005 | |
| Climatic zone: | E | |
| Number of records: | | 16 |

Additional data: other numerical variables that are not included in the archetype

