

STANDARDIZED FORM FOR ENERGY AUDITS IN SCHOOL BUILDINGS

TEENERGY SCHOOLS

ARPA Sicily, Province of Trapani, ITALY

Secondary School for Educational Studies Allmayer - Building n. 8
URBAN AREA

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ABSTRACT SHEET: Building n.8 "Allmayer" ALCAMO



Total Floor Area [m²]: 1537 m²

Total Heated Floor Area [m²]: 1095 m²

Climatic Zone: C

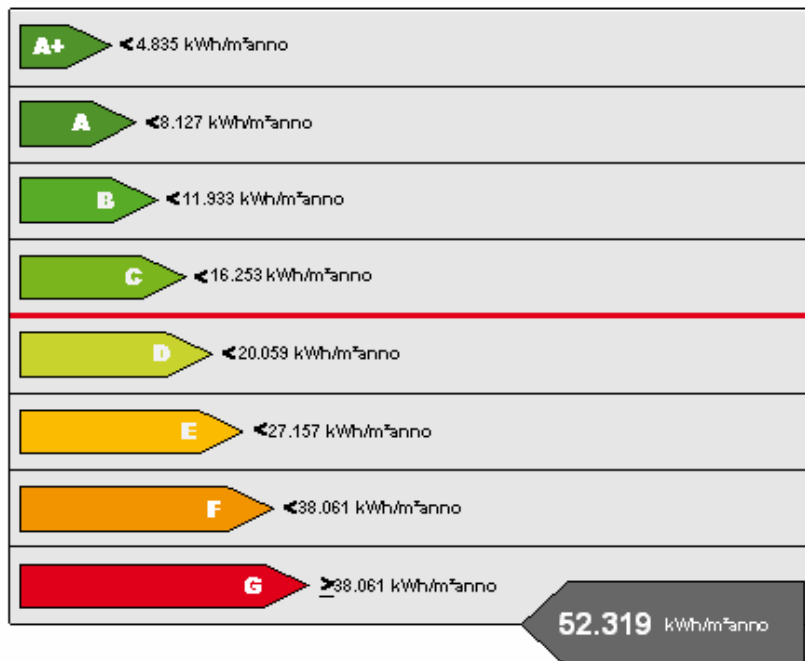
OPERATING ASSESSMENT (AVERAGE VALUE, YEARS 2007/08-2008/09)

Energy consumption for electricity: 37,6 kWh/m²; 9,4 kWh/m³ year

Energy consumption for heating: 40,1 kWh/m² year; **10 kWh/m³ year**

ENERGY CLASS SIMULATION OF THE BUILDING (SOFTWARE TERMUS)

Energy consumption for heating: **52,319 kWh/m³ year**



Energy Performance Index EPI LIMIT: 13,167 kWh/m³ year

CO₂ EMISSIONS: **10,35 kgCO₂/m³year**

SOFTWARE TERMUS (UNI TS 11300):

- $24\text{h/d} * 137\text{d/yr} = 3288\text{ h/yr}$
- Zone C: 15° November - 31° March

SCHOOL HEATING:

- about $4,5\text{ h/d} * 107\text{ d/yr} = 481,5\text{ h/yr}$
- 1° December - 31° March

Termus result is about 6,8 times more than the operating results:

$$52,3 / 6,8 = 7,7 \text{ kWh/m}^3 \text{ year}$$

TRANSMITTANCES

Calculated Transmittance of the wall: $U=1,83\text{ W/m}^2\text{K}$

Calculated Transmittance of the ground floor: $U= 0,78\text{ W/m}^2\text{K}$

Calculated Transmittance of the roof: $U= 1,7\text{ W/m}^2\text{K}$

Calculated Transmittance of the typical aluminium frame window : $U= 4,5\text{ W/m}^2\text{K}$

The structures are not regulated under the Decrees 192/2005, 311/2006 and successive modifications and integrations, transposing in Italy the Directive 2002/91/EC, Energy Performance of Buildings (EPBD).

1. GENERAL INFORMATION

School Building: Secondary School for Educational Studies "Allmayer"

City: Alcamo

Street: Via V.P.Galati, 39

Zip Code: 91011

Phone: 0924 23666

Fax:

Contact person: Headmaster

Web: www.istitutoallmayer.it/

Year of construction: 1951 – 1954

Recent renovation: 2000

Climatic typology:

- Altitude: 258 m
- Latitude: 37° 58' N
- Longitude: 12° 57' E
- Climatic Zone: C
- Degree day: 1140
- Location: URBAN
- Temperature Max: 26,2 °C (August)
- Temperature Min: 11°C (January)
- Maximum summer radiation (W/m²):

ora	Temperatura [°C]	Irradianza solare estiva massima [W/m ²]								
		Orizzontale	Sud	SE	Est	NE	Nord	NO	Ovest	SO
1	25,08									
2	24,70									
3	24,40									
4	24,18									
5	24,10	1	0	2	4	4	2	0	0	0
6	24,25	157	42	260	491	457	182	42	42	42
7	24,63	364	81	466	736	614	165	77	77	77
8	25,30	558	115	584	787	567	116	103	103	103
9	26,28	723	238	621	722	473	129	123	123	123
10	27,40	651	338	587	578	316	138	138	138	141
11	28,68	931	404	492	382	158	147	147	147	174
12	29,88	958	428	349	162	150	150	150	162	349
13	30,78	931	404	174	147	147	147	158	382	492
14	31,38	851	338	141	138	138	138	316	576	576
15	31,60	723	236	123	123	123	129	473	722	621
16	31,38	558	113	103	103	103	116	576	787	584
17	30,85	364	81	77	77	77	165	614	736	466
18	30,03	157	42	42	42	42	182	457	491	260
19	29,05	1	0	0	0	0	2	4	4	2
20	28,08									
21	27,25									
22	26,50									
23	25,90									
24	25,45									

2. BUILDING AREA/VOLUME

2.1 Description of the Building



The school building is located in the center of Alcamo

Number of Floors.

There are two floors: **F0, F1**

F0: ground floor

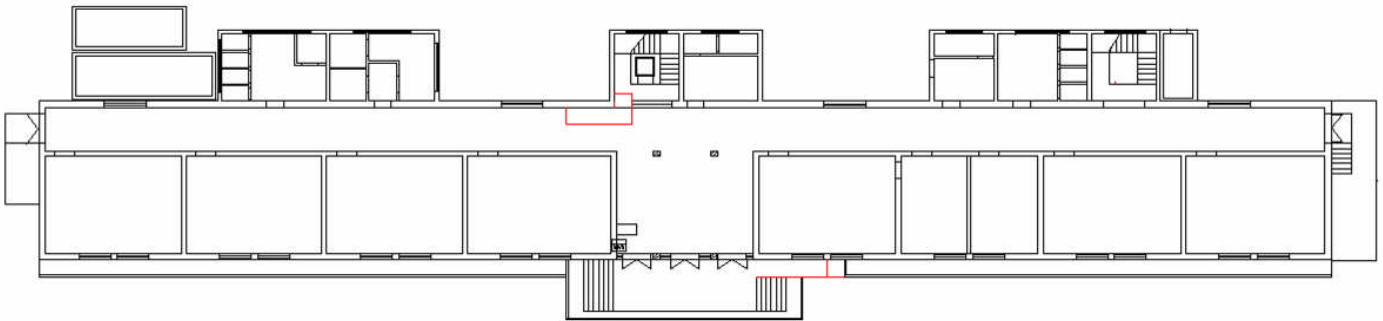
F1: first floor

Total Floor Area [m²]: 1537 m²

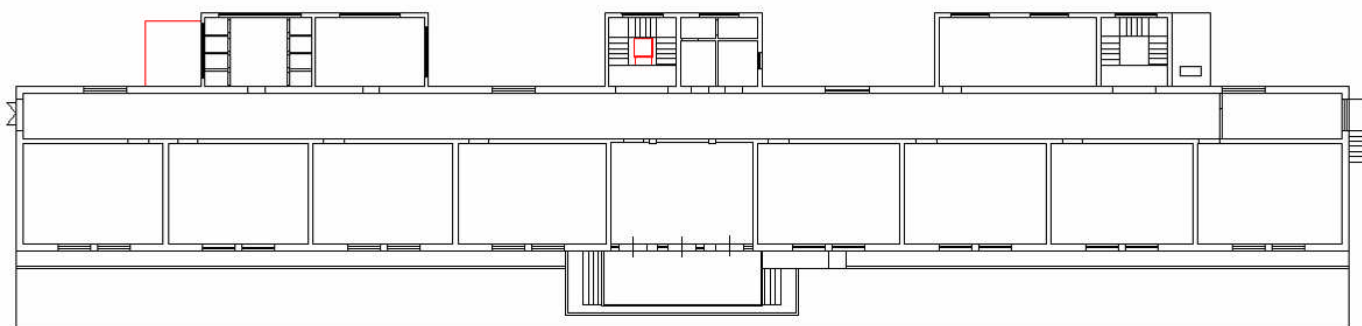
	FO	F1	TOT
Total Heated Floor Area [m ²]	567	528	1095
Total Heated Air Volume [m ³]	2268	2112	4380

	FO	F1	TOT
Total Air-conditioned Floor Area [m ²]	192	37	229
Total Air-conditioned Air Volume [m ³]	768	148	916

1.2 Building Function



AREA F0 GROUND FLOOR	Number of rooms F0	Floor Area [m2] F0	% Building Floor Area
Classroom	3	141	18
Laboratory	1	48	6
Computer Room	1	48	6
Teacher's Room	-	-	-
Meeting Room	-	-	-
Library	-	-	-
Offices	3	121	16
Headmaster Room	1	23	3
Archive	1	26	3
Deposit	1	14	2
Corridor	2	178	23
Entrance	1	71	9
Wc	2	48	6
Caretaker Room	1	18	2
Stairs	2	32	4
Total area F0	19	768	100



AREA F1 FIRST FLOOR	Number of rooms F0	Floor Area [m2] F0	% Building Floor Area
Classroom	8	383	50
Laboratory	-	-	-
Computer Room	-	-	-
Teacher's Room	2	53	7
Meeting Room	1	48	6
Library	1	26	3
Offices	-	-	-
Headmaster Room	-	-	-
Archive	-	-	-
Deposit	1	9	1
Corridor	1	183	24
Entrance	-	-	-
Wc	1	26	3
Caretaker Room	1	9	1
Stairs	2	32	4
Total area F1	18	769	100

Number of Employees:

Teachers	30
Other employees	15

Number of Students:

Students	211
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Weekly Occupancy

Days of Week	Time of occupancy*	Total amount of hours occupancy/day**
Monday	7:50-19:00	10,5
Tuesday	7:50-19:00	10,5
Wednesday	7:50-19:00	10,5
Thursday	7:50-19:00	10,5
Friday	7:50-19:00	10,5
Saturday***	7:50-13,40	6
Total amount of hours occupancy/week		61,50

* Opening and closing times of the school.

** Daily hours occupancy from October to June

***On Saturday there are no lessons and the school is occupied only by the employees.

Monthly Occupancy : 296 days *

Months	Days	Hours
September	24	192
October	26	273
November	25	262,5
December	22	231
January	24	252
February	23	241,5
March	26	273
April	24	252
May	25	262,5
June	25	262,5
July	27	216
August	25	150
Total Hours		2868

*The pupils attend the school lessons for 205 days from October to June


Which sector needs improvement concerning energy consumption?

- **Building insulation** (yes)
- **Heating system** (yes)
- **Cooling systems** (yes)
- **Air-conditioning system/Ventilation** (yes)
- **Installation of hot water** (yes)
- **Lighting** (yes)
- **Building Management System** (yes)
- **Occupants' awareness** (yes)

Specific problems of your building:

The transmittance of the windows, the walls and the floors are not regulated under D.LGS. 311, Italian transposing of the Directive 2002/91/EC on energy performance of buildings.

General improvements:

- **Wall and roof external insulation,**
 - **Low emissivity windows,**
 - **New Central Heating (Condensation Boiler),**
 - **thermostatic valves for each radiator,**
 - **LED lamps.**
- 

3. BUILDING DESCRIPTION

3.1 External photos of the building's facade.



3.2 Density of nearby construction

The school building is inserted into a very dense buildings area (historic centre), but at the same time is surrounded by an area of relevance used for the outdoor activities.



3.3 External wall description

Concrete Blocks () Double Concrete Blocks () Concrete ()
 Brick () Double Brick / Air Gap ()
 Stone (x) Other ()
 Insulated () Type of Insulation : _____

What is the exterior wall color? Clear, pale yellow

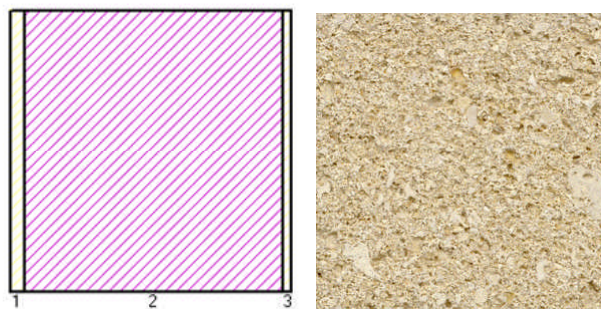
Are the external walls insulated?

Yes () No (x)

If yes, what is the location of the thermal insulation?

Internal () External () In between ()

Describe the layers of the external wall construction:

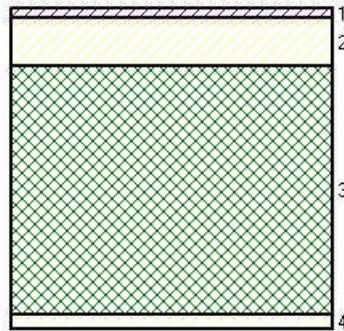


N	Description of wall layers	Thickness (m)
1	Lime cement plaster	0,03
2	Calcareous sandstone	0,35
3	Lime cement plaster	0,02

General data	
Thickness:	0,400 m
Surface mass:	895,00 kg/m ²
Resistance:	0,5456 m ² K/W
Transmittance:	1,8330 W/m ² K
Dynamic parameters	
Attenuation factor:	0,0784
Offset:	13h 19'

Calculated Transmittance of the wall : $U=1,83 \text{ W/m}^2\text{K}$
 Maximum U for zone C: $0,40 \text{ W/m}^2\text{K}$. The structure is not regulated under 311/2006, transposing the Directive 2002/91/EC Energy Performance of Buildings (EPBD).

3.4 Intermediate floors description



N	Description of floor layers	Thickness (m)
1	tiles	0,01
2	Cement mortar	0,05
3	Brick based slab	0,24
4	Plaster of lime and gypsum	0,02

General data	
Thickness:	0,320 m
Surface mass:	370,00 kg/m ²
Resistance:	0,6043 m ² K/W
Transmittance:	1,6548 W/m ² K
Dynamic parameters	
Attenuation factor:	0,3046
Offset:	8h 44'

Calculated Transmittance of the floor: $U = 1,65 \text{ W/m}^2\text{K}$.

3.5 Ground floor description

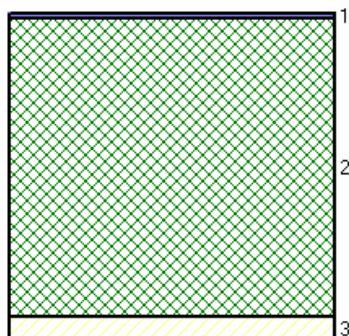


N	Description of ground floor's layers	Thickness (m)
1	tiles	0,01
2	Cement mortar	0,05
3	Brick based slab	0,24
4	Air layer	0,50
5	Light concrete layer	0,10

General data	
Thickness:	0,900 m
Surface mass:	471,50 kg/m ²
Resistance:	1,2845 m ² K/W
Transmittance:	0,7785 W/m ² K
Dynamic parameters	
Attenuation factor:	0,1590
Offset:	11h 45'

Calculated Transmittance of the ground floor: $U = 0,78 \text{ W/m}^2\text{K}$.
 Maximum U for zone B: $0,49 \text{ W/m}^2\text{K}$. The structure is not regulated under DLgs 311/2006, transposing the Directive 2002/91/EC Energy Performance of Buildings (EPBD).

3.6 Roof description



N	Description roof B layers	Thickness (m)
1	waterproofing	0,005
2	Cement plaster	0,04
	Brick based roof element (495*200*250*)	0,25
3	Lime and cement plaster	0,02

General data	
Thickness:	0,324 m
Surface mass:	354,50 kg/m ²
Resistance:	0,5802 m ² K/W
Transmittance:	1,7235 W/m ² K
Dynamic parameters	
Attenuation factor:	0,2778
Offset:	8h 37'

Calculated Transmittance of the roof B: $U = 1,7 \text{ W/m}^2\text{K}$.
 Maximum Transmittance: $0,38 \text{ W/m}^2\text{K}$. The structure is not regulated under DLgs 311/2006, transposing the Directive 2002/91/EC Energy Performance of Buildings.

4. WINDOWS

LIST OF WINDOWS

TYPE OF AREA F0	FLOOR AREA [m ²]	NUMBER OF WINDOWS	ORIENTATION OF WINDOWS	TOTAL WINDOW AREA [m ²]	GLASS TYPE	WINDOW'S STRUCTURE	TYPE OF WINDOWS	PRESENT CONDITION
Classroom 1	47	2	S	6,46	double	aluminium	open	good
Classroom 2	47	2	S	6,46	double	aluminium	open	good
Classroom 3	47	2	S	6,46	double	aluminium	open	good
Office 4	50	2	S	6,46	double	aluminium	open	good
Office 5	48	2	S	6,46	double	aluminium	open	good
Office 6	23	1	S	3,23	double	aluminium	open	good
Headmaster Office 7	23	1	S	3,23	double	aluminium	open	good
Computer Classroom 8	48	2	S	6,46	double	aluminium	open	good
Laboratory 9	48	2	S	6,46	double	aluminium	open	good
Wc A	26	1	O	1,62	single	aluminium	vasistas	good
		1	N	2,16	single	aluminium	vasistas	good
Wc B	22	1	N	1,08	single	aluminium	vasistas	good
Entrance	71	3	S	16,22	double	aluminium	open d'emergenza	good
Archive 10	26	1	E	1,62	single	aluminium	vasistas per 1/3	good
		1	N	1,62	single	aluminium	vasistas per 1/3	good
		1	N	0,54	single	aluminium	vasistas per 1/3	good
Caretaker Room	18	1	E	1,02	single	aluminium	open	good
		1	N	1,08	single	aluminium	vasistas	good
Deposit	14	1	N	0,72	single	aluminium	vasistas	good
		1	O	3,20	double	aluminium	open	good
Corridor A	89	2	N	9,8	double	aluminium con tappar	open	good
		1	E	1,76	double	aluminium	emergency door	good
Corridor B	89	2	N	9,8	double	aluminium con tappar	open	good
		1	O	1,76	double	aluminium	emergency door	good
Stair A	16	1	N	7,88	single	aluminium	open	good
Stair B	16	1	N	1,56	single	aluminium	open	good

TYPE OF AREA F1	FLOOR AREA [m2]	NUMBER OF WINDOWS	ORIENTATION OF WINDOWS	TOTAL WINDOW AREA [m2]	GLASS TYPE	WINDOW'S STRUCTURE	TYPE OF WINDOWS	PRESENT CONDITION
Classroom 1	47	2	S	9,6	double	aluminium	open	good
Classroom 2	47	2	S	9,6	double	aluminium	open	good
Classroom 3	47	2	S	9,6	double	aluminium	open	good
Classroom 4	50	2	S	9,6	double	aluminium	open	good
Classroom 5	48	1	S	5,26	double	aluminium	open	good
		2	S	9,6	double	aluminium	open	good
Classroom 6	48	2	S	9,6	double	aluminium	open	good
Classroom 7	48	2	S	9,6	double	aluminium	open	good
Classroom 8	48	2	S	9,6	double	aluminium	open	good
Classroom 9	48	2	S	9,6	double	aluminium	open	good
Library 10	26	1	E	1,62	double	aluminium	open	good
		1	N	1,62	double	aluminium	open	good
		1	N	0,54	double	aluminium	open	good
Teachers Room 11	37	2	N	6,46	double	aluminium	open	good
Classroom 12	16	1	N	4,8	double	aluminium	open	good
		1	E	3,05	double	aluminium	open	good
Caretaker Room	18	1	E	1,02	double	aluminium	open	good
		1	N	1,08	double	aluminium	vasistas	good
Wc A	26	1	O	1,62	single	aluminium	vasistas	good
		1	N	2,16	single	aluminium	vasistas	good
Corridor A	183	4	N	19,6	double	aluminium	open	good
		1	E	1,76	double	aluminium	emergency door	good
Stair A	16	1	N	7,88	single	aluminium	open	good
Stair B	16	1	N	4,8	single	aluminium	open	good

ORIENTATION

ORIENTATION	FLOOR	NUMBER OF WINDOWS	AREA OF WINDOWS (m2)	TOTAL (m2)	
N	F0	1	1,08		
		1	2,16		
		1	2,85		
		1	1,62		
		1	0,54		
		1	1,08		
		2	0,72		
		2	9,8		
		2	9,8		
		1	7,88		
		1	1,56		
		partial total	14	39,09	39,09
		F1	1	1,62	
	1		0,54		
	1		6,46		
	1		1,62		
	1		4,8		
	1		1,08		
	1		2,16		
	4		19,6		
1	7,88				
1	1,56				
partial total	13	47,32	47,32		
total			86,41		

ORIENTATION	FLOOR	NUMBER OF WINDOWS	AREA OF WINDOWS (m2)	TOTAL (m2)
E	F0	1	1,62	
		1	1,02	
		1	1,76	
	partial total	3	4,4	4,4
	F1	1	1,62	
		1	3,05	
		1	1,02	
1		1,76		
partial total	4	7,45	7,45	
total			11,85	

ORIENTATION	FLOOR	NUMBER OF WINDOWS	AREA OF WINDOWS (m2)	TOTAL (m2)
S	F0	2	6,46	
		2	6,46	
		2	6,46	
		2	6,46	
		2	6,46	
		1	3,23	
		1	3,23	
		2	6,46	
		2	6,46	
		3	16,22	
	partial total	19	67,9	67,9
	F1	2	9,6	
		2	9,6	
		2	9,6	
		2	9,6	
		1	5,26	
		2	9,6	
		2	9,6	
		2	9,6	
		2	9,6	
2		9,6		
partial total	19	91,66	91,66	
total				159,56

ORIENTATION	FLOOR	NUMBER OF WINDOWS	AREA OF WINDOWS (m2)	TOTAL (m2)
O	F0	1	1,62	
		1	3,2	
		1	1,76	
	partial total	3	6,58	6,58
	F1	1	1,62	
partial total	1	1,62	1,62	
total				8,2

Conclusion;

The fixtures are in good condition. However the transmittance of the structures is higher than the maximum U for zone B: 3 W/m²K. The windows are not regulated under DLgs 311/06, transposing the Directive 2002/91/EC Energy Performance of Buildings (EPBD).



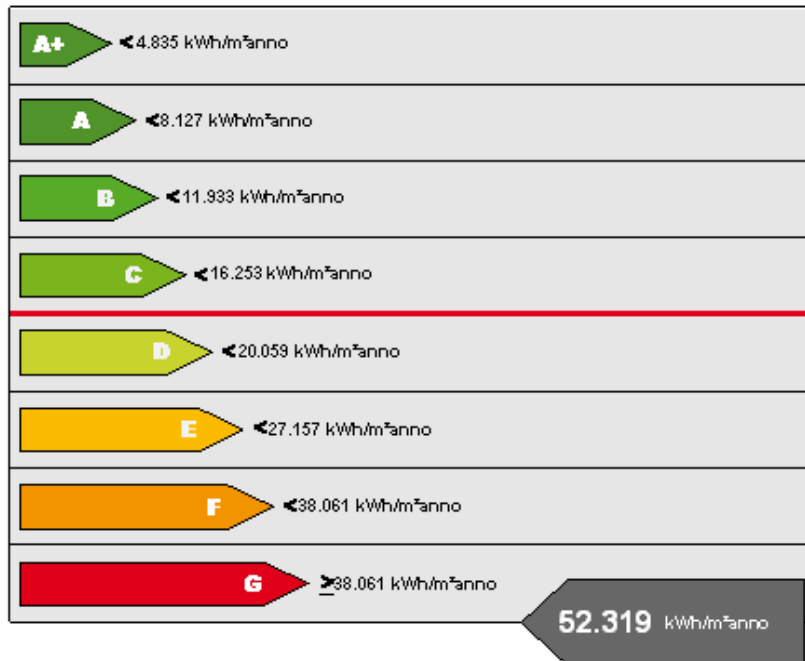
Typical window with aluminium frame on the waterfront	
Type of frame material:	Aluminum without thermal break
Type of glazing:	4-6-4
percentage of the frame area than in the entire window area:	30%
Thermal transmittance Uw	4,5 W/m ² K

5. SIMULATION OF BUILDING'S ENERGY CONSUMPTION

5.1. Simulation

For the Energy Class simulation of the building the software Termus was used. In Italy this Software is authorized for the elaboration of Energy Classification certificates. (Further indications concerning the common calculation methodology for the building's energy consumption will be given in order to guarantee comparable results throughout the partnership)

Energy consumption for heating: 52,319 kWh/m³ year



Energy Performance Index EPI LIMIT: 13,167 kWh/m³ year

CO2 EMISSIONS: 10,35 kgCO₂/m³year

5.2 Natural Light Simulation

For the Natural Light simulation a selection of 3-4 types of classrooms should be made according to the windows' orientation and Selection of the most critical date of the year (Date: 21/12 Hour: 10:00)

Classroom A - Windows' orientation to

2D graphic that represents the incident light in the classroom

- Average Daytime Factor of light
- Minimum Daytime Factor of light
- Maximum Daytime Factor of light

3D graphic that represents the illumination measured in lux (Unit of measurement of light) of the classroom

- Average unit of illumination
- Minimum unit of illumination

- Maximum unit of illumination

work surface

Classroom B - Windows' orientation to

2D graphic that represents the incident light in the classroom

- Average Daytime Factor of light
- Minimum Daytime Factor of light
- Maximum Daytime Factor of light

3D graphic that represents the illumination measured in lux (Unit of measurement of light) of the classroom

- Average unit of illumination
- Minimum unit of illumination
- Maximum unit of illumination

work surface

Classroom C - Windows' orientation to

2D graphic that represents the incident light in the classroom

- Average Daytime Factor of light
- Minimum Daytime Factor of light
- Maximum Daytime Factor of light

3D graphic that represents the illumination measured in lux (Unit of measurement of light) of the classroom

- Average unit of illumination
- Minimum unit of illumination
- Maximum unit of illumination

work surface



6. HEATING SYSTEM AND ENERGY SUPPLY

6.1 Description of heating system

Type of System	Units	Power [kW]	Heated Floor Area [m ²]	Daily Hours of Operation	Months of Operation
Central	1	120-232	1095	4,5	December - April
Heat Pump	7	1,09	238,5	RARELY	December - April

Months	Days	Hours/month (Total school area)
December	23	103,5
January	25	112,5
February	23	103,5
March	24	108
April	12	54
Total annual	107	481,5

6.2 Condition of heating system

Is the boiler insulated? Yes (X) No ()
What is the condition of the insulation? Good (X) Fair () Bad ()
Missing () Damaged () Other: _____

Is the heat distribution system insulated? Yes (X) No ()
What is the condition of the insulation? Good (X) Fair () Bad ()
Missing () Damaged () Other: _____

Is temperature control available? Yes (X) No ()
Specify set temperature (C): 21°C
Set temperature is set by :
Space occupants () Building manager (X)
Other: _____

Provision for temperature setback: Yes () No ()
Specify set temperature (C) : _____

6.3 Operating Schedule

(List hours of operation of the heating system)

Days of Week	Time Heating is Turned On	Total amount of hours heating/day
Monday	07,30-12,00	4,5
Tuesday	07,30-12,00	4,5
Wednesday	07,30-12,00	4,5
Thursday	07,30-12,00	4,5
Friday	07,30-12,00	4,5
Saturday	07,30-12,00	4,5
Total amount of hours occupancy/week		22,5

6.4 Use of Renewable Energies

Does the building have any passive solar heating systems?

Yes () No (X)

Does the building have any other solar energy system?

Yes () No (X)

Does the building have any other renewable energy system?

Yes () No (X)

If Yes, check all that apply:

Passive System	No of Units	Location	Characteristic Dimensions	Description
Greenhouse				
Atrium				
Heat storage				

PROBLEMS: _____



7. COOLING SYSTEM

Type of System	Units	Power [kW]	Cooled Floor Area [m ²]	Daily Hours of Operation	Months of Operation
SPLIT Offices 4-5, F0	3	0,9	98	10	SPLIT Offices 4-5, F0
SPLIT Office 6, F0	1	0,9	23	10	SPLIT Office 6, F0
SPLIT pHeadmaster office 7, F0	1	0,8	23	7	SPLIT pHeadmaster office 7, F0
SPLIT Classroom 8, F0	1	0,8	48	7	SPLIT Classroom 8, F0
SPLIT Classroom 5, F1	1	0,8	48	7	SPLIT Classroom 5, F1

Is temperature control available? Yes No

Specify set temperature (C): 24°C

Set temperature is set by:

Space occupants Building manager Other: _____

Provision for temperature setup

Specify set temperature (C): _____

Operating Schedule (List hours of operation of the cooling system)

Days of Week	Time A/C Turned On
Monday	08,30- 17,00
Tuesday	08,30- 17,00
Wednesday	08,30- 17,00
Thursday	08,30- 17,00
Friday	08,30- 17,00
Saturday	08,30- 13,30

Does the building have any passive cooling systems?

Yes No

Are the occupants satisfied with the performance of the passive systems?

Yes No

If No, what are the major problems?

SYSTEM: _____

PROBLEMS: _____

8. LIGHTING SYSTEM

TYPE OF AREA F0	FLOOR AREA [m2]	TYPE OF LIGHTS1	NUMBER OF LIGHTS	WATTS/LAMP	TOTAL WATTS	TOTAL W/m2	FIXTURE MOUNTING
Classroom 1	47	SFL	8	45	360	8	ATT
Classroom 2	47	SFL	8	45	360	8	ATT
Classroom 3	47	SFL	8	45	360	8	ATT
Office 4	50	SFL	8	45	360	7	ATT
Office 5	48	SFL	8	45	360	8	ATT
Office 6	23	SFL	4	36	144	6	ATT
Headmaster office 7	23	SFL	4	36	144	6	ATT
Computer classroom 8	48	SFL	8	36	288	6	ATT
laboratory 9	48	SFL	8	36	288	6	ATT
archive 10	26	SFL	6	36	216	8	ATT
Caretaker room	18	SFL	4	36	144	8	ATT
deposit	14	SFL	3	36	108	8	ATT
corridor A	89	SFL	20	18	360	4	ATT
corridor B	89	SFL	20	18	360	4	ATT
entrata	71	SFL	12	36	432	6	ATT
Wc A	26	SFL	6	36	216	8	ATT
Wc B	22	SFL	4	36	144	7	ATT
Stair A	16	SFL	1	36	36	2	ATT
Stair B	16	SI	1	60	60	4	ATT
		SFL	1	36	36	2	ATT
autoclave room	7	SFL	2	36	72	10	ATT
heater room	8	SFL	2	36	72	9	ATT

TYPE OF AREA F1	FLOOR AREA [m2]	TYPE OF LIGHTS1	NUMBER OF LIGHTS	WATTS/LAMP	TOTAL WATTS	TOTAL W/m2	FIXTURE MOUNTING
Classroom 1	47	SFL	8	45	360	8	ATT
Classroom 2	47	SFL	8	45	360	8	ATT
Classroom 3	47	SFL	8	45	360	8	ATT
Classroom 4	50	SFL	8	45	360	7	ATT
Classroom 5	48	SFL	8	45	360	8	ATT
Classroom 6	48	SFL	8	45	360	8	ATT
Classroom 7	48	SFL	8	45	360	8	ATT
Classroom 8	48	SFL	8	45	360	8	ATT
Classroom 9	48	SFL	8	45	360	8	ATT
library 10	26	SFL	6	45	270	10	ATT
teachers room 11	37	SFL	4	45	180	5	ATT
classroom 12	16	SFL	2	36	72	5	ATT
caretaker rom	18	SFL	4	36	144	8	ATT
Wc A	26	SFL	6	36	216	8	ATT
corridor A	183	SFL	16	36	576	3	ATT
Stair A	16	SFL	1	36	36	2	ATT
Stair B	16	SFL	1	36	36	2	ATT

¹ (Use the following codes)

SI: Standard Incandescent
SFL: Screw -in or compact Fluorescent
EEI: Energy Efficient Incandescent
HID: High Intensity Discharge
(High pressure sodium, metal halide or mercury vapour)
Other: _____

²(Use the following codes)

RGD: Recessed with glass diffuser
RPD: Recessed with plastic diffuser
SUS: Suspended
ATT: Attached
Other: _____

Floor area of spaces that need continuous electrical lighting:

There are no spaces that need a continuous electrical lighting

or as a percentage of building's total floor area

Lighting Schedule

(List hours of operation of the lighting system)

Days of Week	Time Lights Turned On	Percent of area with Lights Turned On	Total hours of lighting
Mondays to Saturdays	4 (average)	98%*	4

*the percentage of area with lights not continuously turned on is the area of bathrooms (2%)



9. HOT WATER SYSTEM

Type of System	Thermostat (C)	Volume (lt)	Power (kW)	Units	Daily Hours of Operation	Months of Operation
Electric heater	65°	10	1,5	1	7	All year

* For Solar Collector instead of power enter collector surface area (m²)

Hot Water Uses:

Application	Hours/Period of Operation	Location	Estimated Consumption [It]	Estimated Number of People Using it
General Use	7 hours/day		60	20

10. OTHER EQUIPMENT

List all energy equipment (other than lighting, air conditioning, heating, and domestic hot \ that is greater than 2 kW input or is used more than 2 hours per day or both.

Area F0

Type of System	Location	Units	Power (kW)	Daily Hours of Operation	Months of Operation
Computers	office4	3	0,14	6	September-July
Monitors LCD	office4	3	0,08	6	September-July
printers	office4	2	tandby 0,03	5	September-July
	office4		attività 0,30	1	September-July
scanner	office4	1	0,25	1	September-July
Coffee/snack machines	Entrance	5	0,5	10	September-July
frigo	caretaker room	1	0,45	24	September-June
computers	office 5	6	0,14	6	September-July
Monitors LCD	office 5	6	0,08	6	September-July
printers	office 5	3	tandby 0,03	1,5	September-July
			attività 0,30	0,5	September-July
computers	office 6	1	0,14	6	September-July
Monitors LCD	office 6	1	0,08	6	September-July
printers	office 6	1	tandby 0,03	5	September-July
	office 6		attività 0,30	1	September-

					July
copy machine	deposit	1	tandby 0,04	5	September-July
			attività 1,26	1	September-July
computers	headmaster office 7	1	0,14	6	September-July
Monitors LCD	headmaster office 7	1	0,08	6	September-July
printers	headmaster office 7	1	tandby 0,03	5	September-July
			attività 0,30	1	September-July
computers	computer calssroom 8	25	0,14	2	September-June
Monitors LCD	computer calssroom 8	25	0,08	2	September-June
printers	computer calssroom 8	2	tandby 0,03	1,5	September-June
	computer calssroom 8		attività 0,30	0,5	September-June
TV 24"	laboratory 9	3	0,1	0,5	September-June
TV 24"	laboratory 9	3	0,1	0,5	September-June

Area F1

Type of System	Location	Units	Power (kW)	Daily Hours of Operation	Months of Operation
Computers	Classroom 12	1	0,14	2	10
Monitors	Classroom 12	1	0,1	2	10
Printers	Classroom 12	1	tandby 0,03	1,5	10
			attività 0,30	0,5	10
TV 28"	Classroom 12	2	0,1	0,5	24
Computers	teachers room 11	2	0,14	2	24
Monitors	teachers room 11	2	0,1	2	24
printers	teachers room 11	1	tandby 0,03	1,5	24
			attività 0,30	0,5	24



11. INFORMATION ON ENERGY CONSUMPTION

Electricity consumption - Results from the bills

2008/2009	Month	Electricity (kWh)
	September '08	5517
	October '08	4608
	November '08	5327
	December '08	5750
	January '09	4843
	February '09	6682
	March'09	5813
	April '09	416
	May '09	4414
	June '09	4474
	July '09	5253
	August '09	4744
	Total	57841

Gas consumption - Results from the bills

2008/2009	Month	Gas (m3)
	September '08	data not received
	October '08	data not received
	November '08	data not received
	December '08	data not received
	January '09	1001
	February '09	1072
	March'09	2127
	April '09	data not received
	May '09	27
	June '09	data not received
	July '09	data not received
	August '09	data not received
	Total	4227

Annual Energy Consumption / Cost of all forms of energy

Type	Quantity	Units	Cost	Monetary Units
Electricity	_____	kWh	_____	_____
Diesel	_____	lt	_____	_____
Oil	_____	lt	_____	_____
Gas	_____	kg	_____	_____

Source of Data: Utility [] Bills [X] Other: _____

What features (if any) do you think make this building more (or less) energy efficient than others (please specify and check all that apply):

- Design or structural features _____
- Building envelope features _____
- Air conditioning features _____
- Lighting features _____
- Controls _____
- Operations and maintenance _____
- Operator training _____
- Occupant behavior _____
- Other _____

How important is the cost of energy (compared with other costs) in determining how the building is operated?

Very important () Important () Average () Not important () Don't know ()

Overall, has total annual energy consumption (not cost) changed in your building in the last five years?

Increased overall (x) Decreased overall () About the same () Don't know ()

If there has been a change in total energy consumption not due to energy conservation measures, why do you think it has occurred?

- Change in building functions Yes () No () Up () Down ()
- Change in building operations Yes () No () Up () Down ()
- Change in occupied floor area Yes () No () Up () Down ()
- Change in building codes Yes () No () Up () Down ()
- Other _____

What energy conservation opportunities (ECOs), including no-cost/low-cost measures, you have taken or plan to take (check all that apply)

Energy Conservation Measures (ECOs)	Date Installed	Planned (next three years)
BUILDING ENVELOPE Solar Barriers		

Insulation		
Windows (reflective films)		
Windows (all other ECOs)		
Other openings:		
Manual Adjustments		
Other:		
CONTROLS / AIR-CONDITIONING Time clocks		
Computer based energy management systems		
Other :		

MECHANICAL (AIR-CONDITIONING) Air-Conditioning		
Distribution system (pipes/ducts)		
Distribution system modifications (other ECOs)		
Domestic (service) hot water		
Manual adjustments		
Energy recovery devices		
Fuel conversions		
Other :		
HEATING Boiler		
Burner		
Distribution system		
Thermal storage		
Other:		
ELECTRICAL / LIGHTING Lighting conversion		
Lighting modifications		
Manual adjustments		
Other:		
RENEWABLE ENERGY SOURCES Solar collectors		
Passive systems (specify) -		
Other:		