Invitation for Competition Submissions

ISOVER Multi-Comfort House Students Contest Edition 2014: School of tomorrow - Gaziantep

International, two-stage, open competition

CertainTeed SAINT-GOBAIN

IZOCAM

ISOVER SAINT-GOBAIN

Acknowledgments:

Special thanks to the City Administration Office of GAZIANTEP for all support during the drafting of this task.

Content

1. General information

1.1. Content of the competition

Under the Kyoto Protocol, more than 140 industrial nations have made a commitment to reduce their CO2 emissions drastically and agreed that the usage of energy-saving technologies it is a top priority in order to save our natural resources.

Overall, the building sector is responsible for 40% of the total energy consumption and CO2 emissions in the world demanding a new way of designing each new project and each new renovation.

As the world is becoming increasingly urban, and cities are becoming larger and more densely populated thus increasing our energy consumption as well as the CO2 emission.

Reacting to this situation, more and more local authorities are demanding for their new development projects, designs that fulfil the highest requirements in terms of energy efficiency while providing the highest comfort possible for their inhabitants.

It is the case Metropolitan Municipality of Gaziantep, Turkey, which have decided to implement, Gaziantep Climate Change Action Plan, initiative that aims to improve the life of its citizens towards sustainability and making Gaziantep a pioneer countrywide in sustainability policies.

Following this policies, the Municipality of Gaziantep, Turkey, have decided to start the development of the ECO Project for approximately 200000 inhabitants. The urban administration decided that this project should not only provide the lowest possible energy consumption for the future inhabitants but also the highest degree of comfort.

One key issue of this development is the attention given to children and to their education.

The participants to ISOVER Multi-Comfort House Students Contest 2014 Edition design a school that combined classical school elements with modern learning facilities taking in to account the existing realities for the new ECO Project developed by the Municipality of Gaziantep, Turkey. The school dedicated to children between the ages of 6 to 10 will accommodate a number of 400 to 600 students.

1.2. Who can participate?

Participants can be students of architecture, design and construction engineering from universities of all countries with ISOVER, CertainTeed and Izocam presence and where this competition is held.
Participation is open for all students from 1st to 6th year of study as an individual or in teams of up to 3 team members.
A student cannot be part of two different teams submitting projects for the same edition of the contest. Only one project may be submitted per team.

1.3. Awarding organization

The awarding organization is Saint-Gobain Insulation with the participation of national Saint-Gobain ISOVER, CertainTeed and Izocam organizations.

Responsible person for ISOVER Multi Comfort House Students Contest:
Gabriel Golumbeanu
Saint-Gobain ISOVER
18, avenue d'Alsace, 92400 Courbevoie / France
Tel.: 0033 (0)1.47.62.40.38 / Fax: 0033 (0) 1.47.62.50.48 / Mobile: 0033 (0) 6.78.41.88.59
Email: gabriel.golumbeanu@saint-gobain.com

The contact details for the local ISOVER, CertainTeed and Izocam organization can be found at: *www.isover-students.com/content/view/91/133/*

1.4. Form and organization of the competition

The ISOVER Multi Comfort House Students Contest is a 2 stage competition:

- **First stage – National Stages**
  - Takes place in each country were national Saint-Gobain ISOVER, CertainTeed and Izocam organizations are organizing the contest.
  - Up to three prizes will be awarded for the national stage. The project that won will receive an award at a presentation ceremony.
- **Second stage - International Stage**
  - The International stage of the competition it will be organized in the second part of May 2014. The exact date and location will be communicated by the beginning of October on www.isover-students.com.
  - The winners of the **National Stages** will be invited to this event, together with their professors. A maximum number of 3 teams from each country accompanied by one teacher per team can participate to the international stage. The final number of participants from each country will be decided by each local organization.
  - During this event the participating projects will be displayed at the exhibition for inspection and discussion. Furthermore, the authors of the project will have the possibility to explain the concept of the project to the jury and all the participants during a five-minute presentation. All presentations will be webcasted live on ***http://www.isover-students.com***
  - The presentations will be followed by the jury's deliberations and the award ceremony for the winners. The international jury will nominate the winners of the three prizes for the **International Stage**. In addition, the jury can award some special prices for extraordinary ideas provided by the participants.

1.5. Prize money

Each of the two stages of the competition can assign up to three monetary prizes for the first, second and third place. Additionally, other prizes might be awarded by the local organization.

- **First stage – National Stage:**
  - Information about the prizes of the national contest stage will be provided by the local ISOVER, CertainTeed or Izocam organizations.
- **Second stage – International Stage:**
  - 1st prize € 1,500
  - 2nd prize € 1,000
  - 3rd prize € 750
  - Special prize € 500

The organizer can decide to award more or less prizes than specified.

1.6. Time schedule

Distribution of invitations for competition submissions as part of an information event:

September 2013

Closing date for registration for the national competition – See point 3.1

- *31st March 2014. Local organization can change this date to fit their local schedule. Please check this data with your local responsible person.*
- *All registrations have to be completed online at www.isover-students.com. Any participating team that fails to do so or provides incomplete or false information can be disqualified from competition.*

Online training

- *Several online trainings will be organized, starting October 2013 until March 2014. The exact dates will be communicated thru the official newsletter of the contest to all registered participants.*

National stages and award ceremonies

- *Completed by 1st May 2014. Local organization can change this date to better fit their local schedule. Please check this data with your local responsible person*

Submission of the material for the international stage - See point 3.2

- *Latest by 12th of May 2014.*

International stage and award ceremony:

- *The International stage of the competition it will be organized in the second part of May 2014. The exact date and location will be communicated by the beginning of October on www.isover-students.com*

Further information will also be provided at the lectures held at the participating universities by the national ISOVER, CertainTeed or Izocam companies. For more information, please contact your local ISOVER, CertainTeed or Izocam organization who will provide you with further details.

1.7. National jury

The selection of the national winners will be carried out by a national jury. The composition of each national jury will be decided by the local implementing organization.
The following criteria will be used for awarding the prizes on national and international level:

A. Participation criteria

- **Minimum requirements:** Project that do not present the minimum required pieces as described in Point 2.5.1 will not be taken in to consideration

B. Judging criteria

- **Architecture: 40%**
  - Design and functional concept as well as the sustainability approach related to economic, ecologic and social aspects
- **Technical criteria: 30%**
  - Constructions comply with the Saint-Gobain Multi-Comfort criteria (thermal, acoustic and daylight targets) as well as fire safety strategy.
- **Construction details: 30%**
  - Quality and consistency of the proposed construction details with regards to building physics (thermal and acoustic bridges, airtightness and moisture management) and correct usage and mentioning of ISOVER, Certain Teed, MAG or Izocam products and solutions in the project

1.8. International jury

The international jury will consist of architects, ISOVER experts and specialists in energy efficiency constructions. The organizer can modify the number or the composition of the jury without any other prior advice. The members of the International jury will be announced at the International Stage.
The same criteria of evaluation like in the National Stages will be used for the International Stage.

1.9. Transport and travel expenses

- **First stage – National Stage:**
  - The risks and costs of the submission of entries to the national stages shall be taken over by the participants.
- **Second stage – International Stage:**
  - The forwarding of project documentation to the final international gala shall be carried out by the respective national ISOVER, CertainTeed or Izocam Company.
  - Furthermore, the companies shall bear the entire travel expenses, as well as the costs of accommodation and lodgings for the participants at the international Stage.

1.10. Legal

Participants of the ISOVER Multi Comfort House Students Contest (the 'Competition') hereby undertake that any information/data contained in their projects does not interfere with the intellectual property rights of any third party, and that they either own or have full authorization to use and disclose such information/data.

Competition participants shall retain unlimited intellectual property rights on their projects.

However, the participants to the national stage or international stage competitions, regardless of their position (students, teachers, ISOVER employees, IZOCAM employees, CertainTeed employees or other attendees), hereby grant full and unrestricted authorization to Saint-Gobain Isover, CertainTeed and Izocam (the "Organizer"), free of charge, to use and publish their projects, project presentations and all material submitted by or representing the participants, including, but not limited to, photos or videos taken of the participants at the contest and/or material provided by the participants to the Organizer for the contest, for an unlimited period of time and for all media publication used by the Organizer.

Competition participants acknowledge that the decision of the jury is final. All participants hereby accept the incontestable and definitive nature of the jury’s decisions.

By participating in the competition, the participants acknowledge and accept the conditions presented here.

1.11. Possible collaboration between participants and the City Administration of Gaziantep

The participants are informed that the representatives of the City Administration of Gaziantep will attend the International Stage.
The City Administration of Gaziantep might be interested by some of the exposed ideas in which case separate discussions between the City Administration and the authors will take place.

2. Details of the task

2.1. General information about the area covered by the contest

Figure 1 - Site map

The school should fit to its surrounding natural and cultural environment. Emphasis should be placed on feasibility, which in turn requires structurally effective and cost-efficient solutions. The schools outside space should be designed in an environmentally friendly way, including pedagogical elements such as a bio-garden, biotope, playground, etc.

2.2. Site and zoning requirements

The size of the whole development area is 10500m2. Maximum 50% of the land can be used for constructions. The maximum height allowed is ground level + one floor, with a maximum height of the construction at the top of 8m.

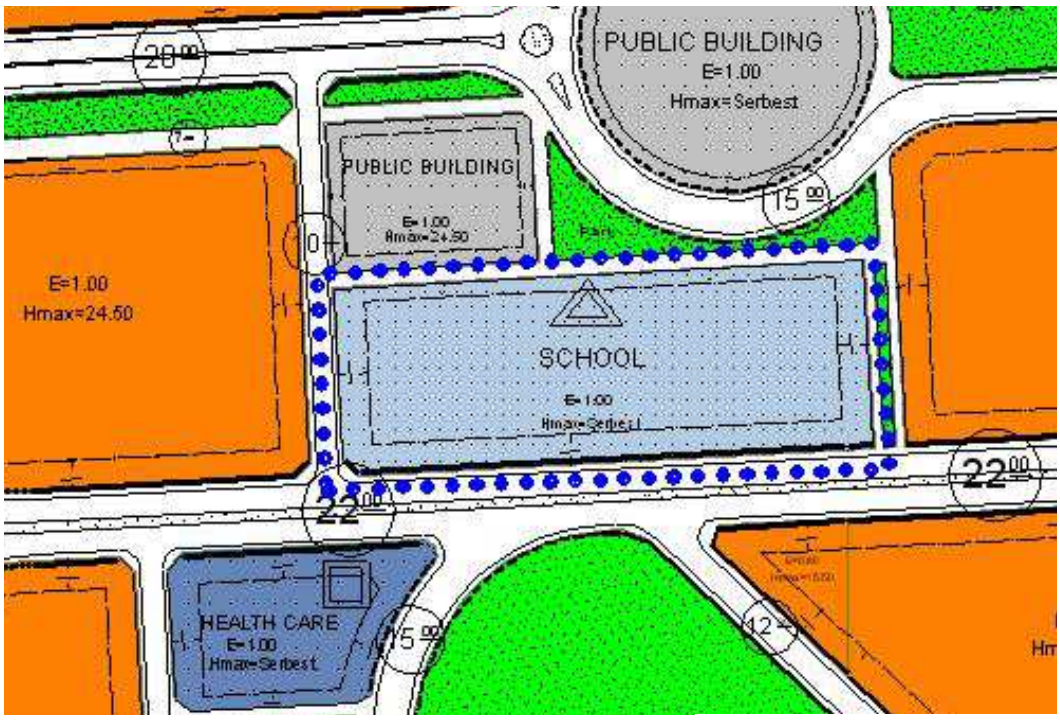

Figure 2 - Site

2.3. Project specifics

2.3.1. School characteristics – Mandatory requirements for indoor functionalities design

As already mentioned the school should accommodate a number of 400-600 students. Each classroom should be designed with facilities for students with locomotors disabilities. The age split of the students is equally distributed with 25% from total number of students for each one of the four years of study.

Beside the classrooms the school should be fitted with facilities (laboratories) for the following activities

- music courses
- art courses
- foreign language courses

A sport hall should also be proposed in the design. The sport hall can be design as part of the existing school structure or as a separate construction. Adequate height (recommend a minimum 8m) should be taken in to account. Specific measures will be taken by the participants in order to provide a good acoustic indoor as well as a good level of light.

Separate sanitary groups will be proposed for girls and boys (recommended for each floor 16 toilets for students (8 for girls and 8 for boys), 2 toilets for disable students and 3 toilets for teachers). Also meeting rooms, rooms for teachers and storage facilities as well as any other spaces that the participants consider fit in order to have a good learning process should be taken in consideration.

The school program will start at start at 8.30 and will end at 14.20.The maximum number of courses per day is limited to six. One hour of study has 40 minutes and it is followed by a 10 minutes break except the case when is followed by the lunch break. One hour during the interval 12.30-14.30 is dedicated to lunch. Lunch time can be differentiated between classes for a better fluidity.

The school should be fitted with catering and cooking facilities (for vegetables from the garden)
The school design should allow the following schedule of courses to be held in good conditions

Courses	Hours /week 1st year	Hours /week 2nd year	Hours /week 3rd year	Hours /week 4th year
Turkish	10	10	8	8
Math	5	5	5	5
Science			3	3
Religion				2
Music	1	1	1	1
Art	1	1	1	1
Games and physical activities	5	5	5	5
Traffic				1
Human rights & Citizenship				2
Foreign Language		2	2	2
Social studies (introduction to science)	4	4	3	
Total	**26**	**28**	**28**	**30**

2.3.2. School characteristics – Indoor free design

Participants will decide freely the number of classrooms they will proposed based on their choice for the number students that will learn in the school, the number of students allocated to each classrooms and the layout of the classrooms in accordance with their view of the school system of the future.

Participants will also decide freely for the number and type of the offices for the school personal both teaching and administrative as well as other spaces as they see fit (ex: storage spaces).

Within the scope of the project, participants are free to propose afterschool activities and or to design any other facilities that they see fit according to their vision of the project beside those already mentioned: library, internet and communications room, multifunctional hall (for lunch, cinema, theatre etc.), others, addressed both to the school program or afterschool activities.

These facilities can be designed separately or combined in the same building as the school or in separate building depending on the individual concept as long as the criteria about maximum surface of the land that can be constructed is respected and the design is considering also the Saint-Gobain Multi Comfort criteria.

2.3.3. School characteristics – Mandatory requirements for outdoor functionalities design

The minimum surface dedicated to outdoor functionalities (including access routes) is 50% of existing land. The following functionalities should be designed:

- Assembly place
- Playground
- Garden for agricultural production

2.3.4. School characteristics – Outdoor free design

The surface occupied by each of the functionalities mentioned at Point 2.3.3 as well as the layout and positioning will be decided by every participant based on their vision of the school and in accordance with the number of students.

Participants can propose any other outdoor functionality as they see fit as long as these functionalities respect the requested criteria.

2.4. Type of construction, technical parameters

The high-performance thermal, acoustic, fire protection and daylight requirements have to be considered in order to achieve the Multi-Comfort criteria. A presentation of the Multi-Comfort concept is available for download at ***www.isover-students.com.***
In the course of the competition, lectures on this subject will be held at the faculties as well as online trainings.

The Multi-Comfort criteria for the residential function are presented below.

			SCHOOL	
			Gaziantep, Turkey	
HEATING ENERGY DEMAND (kWh/m²a)			< 15 kWh/m²a	
COOLING ENERGY DEMAND (kWh/m²a)			< 15 kWh/m²a	
AIR-TIGHTNESS n50 (V/h)			0.6 V/h	
DAYLIGHTING (Daylight autonomy % during functioning hours)			60%	
			Min.	Targeted
SUMMER COMFORT (Overheating % of functioning period)			10%	5%
ACOUSTICS	Between classrooms	***Airborne*** - $D_{nT,w}$+C(dB)	≥58dB	
		Impact - $L'_{nT,w}$+CI(dB)	≤ 45dB	
	Between music laboratory and classrooms	***Airborne*** - $D_{nT,w}$+C(dB)	≥ 63dB	
		Impact - $L'_{nT,w}$+CI(dB)	≤ 40dB	
	Exterior noise	Level of noise coming from outside sources	≤ 25 dB	
SUSTAINABILITY			EPD for all SG products	

Figure 3 – Saint Gobain Multi Comfort Criteria

Participants are expected to present in their design the main strategies they have used in order to achieve the criteria presented in “Figure 3 – Saint Gobain Multi Comfort Criteria”.

2.4.1. Construction

The construction method (load-bearing, wood, steel construction, etc.) can be chosen freely by the participants, but the integration of ISOVER, CertainTeed and/or Izocam products as parts of the construction build-up is mandatory.

ISOVER shall provide free planning assistance in the form of:

- Construction CAD details online data base: ***www.isover-construction.com***
  - First data base in the world containing more than 150 joint construction details, thermal bridge free for 4 different construction systems.
  - All these details have been certified by the Passive House Institute and using it assures thermal bridge free construction.
  - The access is free and the application provides: CAD drawings with different download options, components and products, key figures, isotherms, model and materials, air tightness concept.

Figure 4 – ISOVER Construction details

- Air tightness website: ***www.isover-airtightness.com***
  - All relevant information about the achieving air tightness: methods, products and solutions, concept importance.

- ISOVER Designer Calculation Tool and Brochures containing literature about Multi-Comfort concept for new construction and renovation can be found at ***www.isover-construction.com***

Further Information about the local ISOVER, CertainTeed and Izocam organization can be found on the official contest website ***www.isover-students.com/content/view/137/161***

2.4.2. Thermal comfort

2.4.2.1 Technical parameters for energy efficiency

The following thermal criteria will be targeted:

- An annual heat demand <15kWh/m2.
- An annual cooling demand <15kWh/m2.

In order to achieve these values we recommended the following U values for the envelope components:

- All opaque external constructions U ≤ 0.15 W/m2K, or R > 38 (1/BTUITh-1 ft-2 0F -1) for compact building shape
- All opaque external constructions U ≤ 0.10 W/m2K, or R > 57 (1/BTUITh-1 ft-2 0F -1) for non-compact building shape
- Windows and doors U_W total ≤ 0.8 W/m2K, or R > 7 (1/BTUITh-1 ft-2 0F -1). The 'g' value should be chosen based on the solar heat gain evaluations taking in to account both cold and warm season.

2.4.2.2 Technical parameters for protection against overheating

Several studies have shown the link between the room temperature and the mental activities in the schools. When the inside temperature reaches 30℃ the perfor mance of the students drops to 80% of the performance measured at 22℃.

In order to provide a good learning environment the proposed target for the summer comfort is that the overheating above 25℃ or +77℉ (measured as % from the total period when an activity is taking part in the classrooms) is below 10%.

In order to achieve these values students can design both passive measures (ex: sun louvers, usage of light colour for the exterior surfaces) and active measures (ventilation system with heat recovery bypass for the summer, active cooling measures)

2.4.3. Acoustic comfort - Technical parameters

Most of the existing classrooms have long reverberation time and the high background noise. Due to these facts the students learn less (ex: 50% of the teachers' explanations are not being heard by the students, *Seibein 1998, 600 classrooms in Florida*) and the teachers are taking more days of sick and suffer voice and throat problems.

In order to avoid there problems the following acoustic criteria should be targeted:

Subjects	Classrooms
Maximum level of noise coming from outside	25dB
Airborne sound insulation between classrooms DnT,w + C	≥58 dB
Impact sound insulation between classrooms L'nT,w + CI	≤45 dB
Reverberation time	0.5s

As the estimated level of outside noise in the neighbouring of the school is Leq=65-70dB we recommend the usage of opaque constructions with Rw > 50-55dB as well as windows solutions with an Rw > 40dB. In case of a high % of glazing surfaces on the exterior walls facing noise sources supplementary noise protection methods might be needed.

The participants are advices to analyse also the level of noise generated by the technical equipment (such as HVAC) and if necessary to propose solutions to reduce it (sound insulated HVAC ducts, sound absorbers installed on the ducts).

In order to achieve a good acoustic of the classrooms and the recommended values for reverberation time period students are recommended to use acoustic treatments for the interior of the classrooms: acoustic ceiling or acoustic treatments for the walls. Architectural acoustic measures such as unparalleled walls or a height limited to 2.5m- 3m for the classrooms can also help in achieving the desired acoustic comfort.

2.4.3. Indoor Air Quality

The CO2 concentration has a direct effect of the human decision making performance. The typical outdoor concentrations are around 380 ppm and the ASHRAE recommendations for indoor CO2 levels are not to exceed the outdoor concentration by more than 600 ppm. However there are numerous examples of schools were the indoor CO2 level reaches more than 2500 ppm.
A study by *Department of Energy from Lawrence Berkeley National Laboratory* show that in comparison with a CO2 level of 1000ppm a level of 2500ppm generate large reduction of the performances, the most dramatic declines (in which subjects were rated as “dysfunctional,”) being ‘initiative taking’ and ‘strategically thinking’
In order provide the best conditions for the study process the participants are expected to achieve a concentration of CO2 of maximum 1000ppm inside the classrooms. To achieve this concentration of CO2 the participants should provide a level of the ventilation rate of 30-35mc per hour per person.

2.4.6. Fire safety

All bearing internal and external walls have to achieve at least REI 60 according to EN standards,
The roof and ceilings have to achieve at least REI 60 according to EN standards,
All non-bearing internal walls between different functions (depending on the function) have to achieve at least EI 60 according to EN standards.

2.4.7 Natural daylight

A good level of natural light is mandatory for a good learning process. According to the *CEC study from 1999* a good level of natural light generates higher level of concentration and better short-term memory recall, increasing the student’s performances in standardized test by 20%.

In order to have a good level of daylight the proposed target for the present project is to achieve during the functioning hours natural daylight autonomy of 60%. This means during the teaching hours at least 60% of the time the illumination level has 300lux.

In order to achieve these levels for Gaziantep location under standard conditions it is recommended to use for the classrooms a window to floor ratio of at least 8%.

2.5. Competition requirements

2.5.1. Minimum requirements (mandatory)

The following minimum requirements for descriptions and plans must be considered. Participants are advised to choose appropriate scales for all drawings based on the poster sizes outlined in section 3.1 and 3.2 and the participant's individual design ideas and directions to allow appropriate detail and clarity to be reviewed by the judges.

Master plan

- Experience of learning in the school including the deployment of indoor/ outdoor facilities and connections with the neighbourhood.

School function

- All floor plans *(suggested scale 1:100)*
- Sections
  - *Longitudinal section (suggested scale 1:50)*
  - *Cross section (suggested scale 1:50)*
- Construction details:
  - *Roof, external wall, partition walls, windows, ground and intermediary floors details (suggested scale 1:20 / 1:10)*
    - *Attention should be accorded to thermal/acoustic bridges as well as to airtightness and moisture protection*
  - *Other details as see fit by the participants*
- Views, perspectives and/or photographs of physical models

Calculations

- **Annual heat demand**
  - *Calculation can be done using Designer v.2, Designer v.3 or calculation software PHPP.*
  - *Participants will insert a calculation overview in the project*

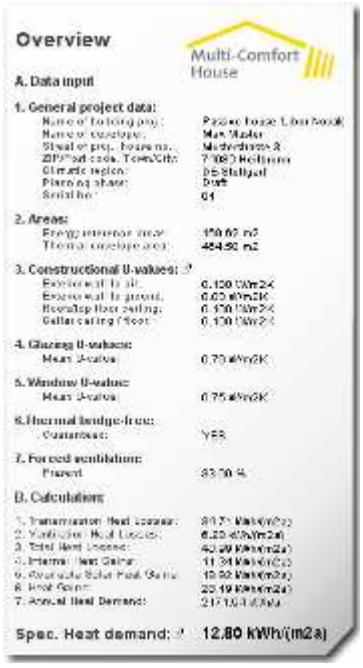

Figure 5 – ISOVER Designer v.2 overview

Falling to provide the requested information above will lead to the disqualification of the project from the competition.

2.5.2. Description of the Design Concept

Beside the minimum requirements the participants are expected to provide sufficient information to allow the jury members to analyse:

- **Design concept and functional solution**
- **Strategy to achieve thermal comfort**
  - Example: construction U values, airtightness concept, HVAC system, passive/active shading measures, cooling, etc.
- **Strategy to achieve acoustic comfort**
  - Example: Constructions Rw and Ln,w values, classrooms acoustics, main measures for sound protection, etc.
- **Strategy to achieve indoor air quality**
  - Example: Proposed type of ventilation (mechanical and/or manual), ventilation blueprint, proposed solutions, etc.
- **Fire safety strategy**
  - Example: Evacuation path, separation, material fire reaction, etc.
- **Natural daylight strategy**
- **Energy supply and overall sustainable concept**

In order to explain the requirements mentioned above the participants can present: text, diagrams, calculations, drawings or information as they seem feat.

3. Formalities for submission

The following formalities have to be fulfilled for the participation in the national stage and international stage of the ISOVER Multi Comfort House Students Contest 2013

3.1. Formalities for submission - National Stages

The participants can register online at: **www.isover-students.com.** All participants registered will receive the official communications via the official online newsletter. Any participating team that fails to register or provides incomplete or false information will be disqualified from competition
The exact way in which the projects will be submitted to the national stage as well as the final local stage schedule will be decided by the respective local organizations. The recommendation is to allow a maximum number of 3 posters in 84 x120 cm format.
The contact details for the local ISOVER, CertainTeed and Izocam organization can be found at ***www.isover-students.com/content/view/91/133/***

3.2. Formalities for submission - International Stage

The formalities for the international stage shall be finalized by latest 12th May 2013. Each of the participant teams shall submit a CD to the ISOVER contact person in their country containing the following information:

1. Project in electronic format with the following characteristics:

- PDF file version 9 or lower
- Resolution 300 dpi
- Dimensions of the poster 180cm x 80cm (height 180cm, width 80 cm).

Maximum number of posters that can be submitted for each team is 1 (one). The poster of each project will contain the following data:

- Team country (e.g. Austria)
- University (e.g. University of Ljubljana)
- Name of the drafter (or all names in the case of a team submission)
- National stage prize (e.g. 1st Prize)

This data will be used by the local ISOVER organization to print and prepare a roll-up display for each team for exhibition of projects during the international stage.

2. An electronic presentation of the project. The file will have the following characteristics:

- A single Power Point Presentation file
  - Extension PPT or (PPTX). Other file types will not be accepted.
- The file name should be: Country X_Y Prize, Name1_Name2_Name 3.
  - Example: Serbia, 2nd Prize, Ilian Dragutinovici_Igor Pancic
- Maximum dimension of the file, not archived, has to be less than 20 MB.
  - All presentations bigger will be cut to required dimension.

This file will be used during the international stage for the official presentation of the project in front of the jury.

3. Individual pictures of each member of the team in tiff format, scheme CMYK, resolution 300 dpi.

4. Three tiff files containing pictures or details of the project in 300 dpi resolution:

- First picture: buildings preview (usually 3D model)
- Second picture: architectural plans (graphics, sections, drawings, models others.)
- Third picture: insulations (ideas, drawings etc.)

This data will be used for the edition of the book "ISOVER Multi-Comfort House Students Competition - Best of the Projects 2013".