



Multi-Comfort  
House

Live comfortably –  
Save natural resources.

The ISOVER Multi-Comfort House.

**ISOVER**

# Whoever cares about our planet should

## Passive houses – benefit also for our greater home: the planet.



*Live comfortably –  
in unison with nature.*

Life in a passive house offers a great many advantages. Its inhabitants enjoy unparalleled comfort and contentment, a sense of pervasive well-being that penetrates every corner of the building, and yet sustainable net benefit to the environment.

For a long time now, the ecological effects of a lifestyle aligned to maximizing personal prosperity have become noticeable for all of us. The climate is changing. Natural phenomena such as tornadoes occur more frequently. At the same time, the glaciers are retreating and polar caps melting. The number of natural disasters is on the increase, reaching hitherto unknown levels: flooding on the one hand and drought on the other cost millions of lives every year. But we all have to pay, each and every one of us: we all suffer from bad air, loaded with fine dust, ozone and rising CO<sub>2</sub> levels. For this reason, climate protection is regarded worldwide as the greatest challenge of this millennium. This brochure shows how prudent and agreeable it is to start with your own four walls.

## Whoever can take responsibility should do so.

ISOVER has declared its unwavering commitment to climate protection and comfortable living! We are the leading producers of insulation materials. And for us this means very special obligations. Every day, we strive to develop increasingly efficient and resource-saving products, offering them at prices that benefit people

throughout the world. For instance, with our ISOVER brand we have long succeeded in establishing environmentally sound insulating materials in the market. By using mineral wool consisting up to 80% of recycled materials, we go easy on our environment. At the same time, we have achieved excellent properties which have helped

establish the passive house standard and thus the ISOVER Multi-Comfort House.

## Nature is the best teacher.

As attractive and cuddly as bird, penguin, bear & co may look, it cannot obscure the simple fact that their feathers or fur have a very important

# actively protect it.

function: efficient thermal insulation. Depending on the temperature, birds can ruffle their plumage to varying degrees, thus protecting themselves against heat and cold. And as for the unprotected parts of the body, the motto is simply “tuck in under a down quilt” and every thermal bridge is snugly excluded all way round.

But nature is capable of more. The passive use of solar power, for instance. To survive in the frigid polar north, the polar bear uses the sun as energy source for its heating system. Each hair in its thick fur functions as a conduit through which the light penetrates. At the root of the hair the transmitted light meets the bear's black skin and is absorbed as energy. To be more precise: light's energy is absorbed and used to maintain the animal's body temperature. Thermal insulation against heat loss is ensured by a several centimeters thick layer of blubber.



*They have been providing the model for thousands of years: rational use of energy ensures our survival.*

# Responsible building – Comfortable

Judging from the outward appearance of the passive house alone provides few clues as to what it really is: perhaps the lack of a chimney? Apart from this omission, it defines itself merely by its inner values. The passive house standard implies that next to no active supply of heat is necessary any more. The house's main heat sources are the sun, its

occupants, household appliances and heat recovered from the exhaust air. How is this possible? First and foremost, due to the "passive" components, for example thermal insulation windows, heat exchange systems and efficient insulation. The passive house standard fulfils today the energy efficiency requirements of tomorrow.



## The Multi-Comfort House: a wealth of advantages.

The passive house standard makes active savings on energy consumption. At the same time, there is much less for you to worry about: Not about the heating which is only rarely needed. Not about window ventilation which is no longer necessary – but possible any time. And not about rising costs! Even heated energy price debates leave

you cold. And what is more, you can enjoy your own patch of paradise in the Multi-Comfort House, for instance constant, agreeable room temperature in both winter and summer. The best room air quality, comparable to that of a fresh air health resort: With no drafts. And all this without complicated technology.

## No big deal for the passive house: low energy values.

As much as the fuel consumption of a car is an indicator of its economy, the characteristic energy values of a house indicate its energy consumption. For the passive house standard, the annual heating requirement has been set to a maximum of 15 kWh/m<sup>2</sup>a (this corresponds to 1.5 l oil per m<sup>2</sup> living space and year). This value is internationally valid –

Car 	House 	House 	
Liter/100 km	kWh/m <sup>2</sup> a	Liter/m <sup>2</sup> a	
20	200	20	Old building
8-10	80-100	8-10	Building regulations
3-5	30-50	3-5	Low-energy house
1.5	15	1.5	Passive house/ Multi-Comfort House

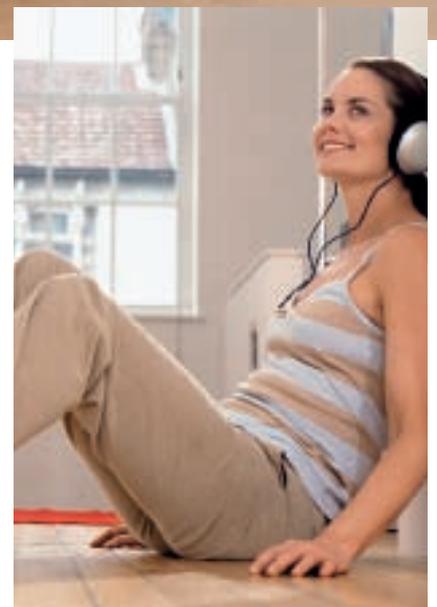
The building regulations differ from country to country.

# living.



both in many European countries and elsewhere in the world. For houses that enjoy an ideal southern orientation and are equipped with appropriate heat buffers, the energy value can be reduced even further, to almost zero. The passive house then becomes a virtual zero-heating energy house. Even so, the energy saving potential offered by the passive house amounts to at least 90 % of the average energy costs of existing residential build-

ings – with no restrictions on architectural design. Comparison with new buildings is also impressive. It is worth noting that a conventionally built new house requires about 6 to 10 l oil per m<sup>2</sup> living space and year. When building according to the passive house standard, you can reckon with a maximum annual consumption of 1.5 l oil or 1.5 m<sup>3</sup> natural gas per m<sup>2</sup> living space!

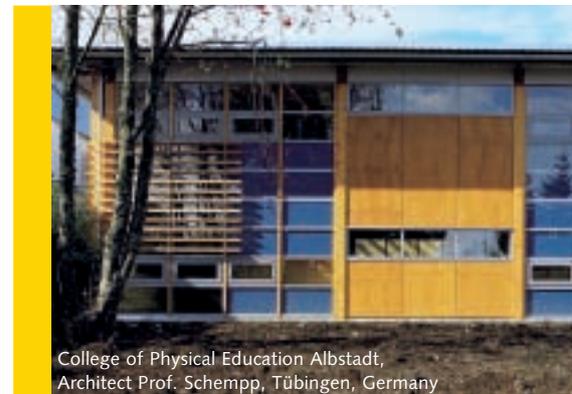


# Unlimited design possibilities

## From single-family houses to kindergartens: any use is possible – and also makes sense!

What started with a research project by Dr Wolfgang Feist in May 1988, has in the meantime made its triumphant advance into ecological housing construction, with thousands of examples: the passive house standard. Whether detached house, row house or building complex – every variant has already been built, moved into and adjudged excellent. This does not mean that passive houses may only be used for living. Depending on their size and construction, they are also used as offices, hotels, schools, kindergartens or old people's homes. Even commercial businesses, even a church, feel at home in the passive house. As passive houses do not fundamen-

tally differ from conventional buildings as far as their structural requirements are concerned, the freedom of architectural design is virtually unlimited. From this viewpoint, the later appearance is merely a matter of taste – just as with every conventional building project. When renovating old buildings, passive house components have recently gained in both importance and reputation: for good reason. Project evaluations have shown that the use of passive house components not only results in substantial energy savings, but also sets the benchmark for improving the constructional quality of old houses.



College of Physical Education Albstadt,  
Architect Prof. Schempp, Tübingen, Germany

## Individual architecture is standard.

As the Multi-Comfort House only reveals its virtues from the inside, it can be externally designed like every other normal house – or completely different. Within the framework set by official regulations, the passive house standard allows, for instance, all roof types. Whether gable, hip, pent or a flat

roof etc. – there are no restrictions. The entire range of materials can be used – from brickwork, wood, steel all the way to glass. One thing is for sure: the Multi-Comfort House will always reflect the individual character of its builder. And in the future, modular elements will ensure even

more economical construction. It is true that the initial planning phase costs a little more time and effort, but in the final phase most details have already been well thought through so that the project can be executed with a high degree of security.

ities.



Passive house Proyer, Steyr · Proyer & Proyer Architects OEG, Steyr, Austria



WeberHaus, Rheinau-Linx, Germany



Disc-shaped passive house Salzkammergut  
Architect's office DI Hermann Kaufmann, Schwarzach, Austria

## Innovative building pays off.

No Multi-Comfort House needs to be afraid of a cost comparison with conventionally built houses. On the contrary, costs of an average passive house lie well below the top prices for new buildings. Passive house projects built at particularly low costs often come

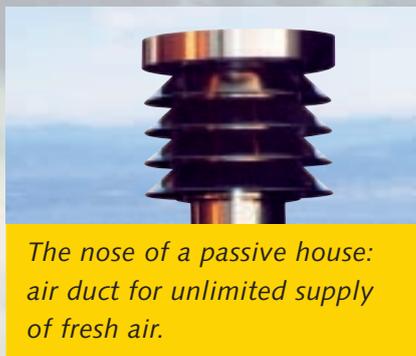
much cheaper than average houses of conventional design. At the end of the day, even if today an extra 5 to 8 % must be realistically budgeted for, the cost relief achieved due to savings in energy consumption fully pays off from the very first day. Another clear

asset is the higher resale value: Multi-Comfort Houses simply have an unbeatable economic edge over conventionally built new housing.

# Quite normal and energy-efficient permanent fresh-air climate control

**Air in a Multi-Comfort House is constantly in motion. Always fresh. And not stale even after a 4-week holiday.**

Similar to the human lung, the Comfort Ventilation System ensures that you are always supplied



plied with fresh air in the Multi-Comfort House. An air flow, produced with a minimum of energy, is permanently circulated through all rooms – virtually soundless and imperceptible. It is used for multiple purposes:

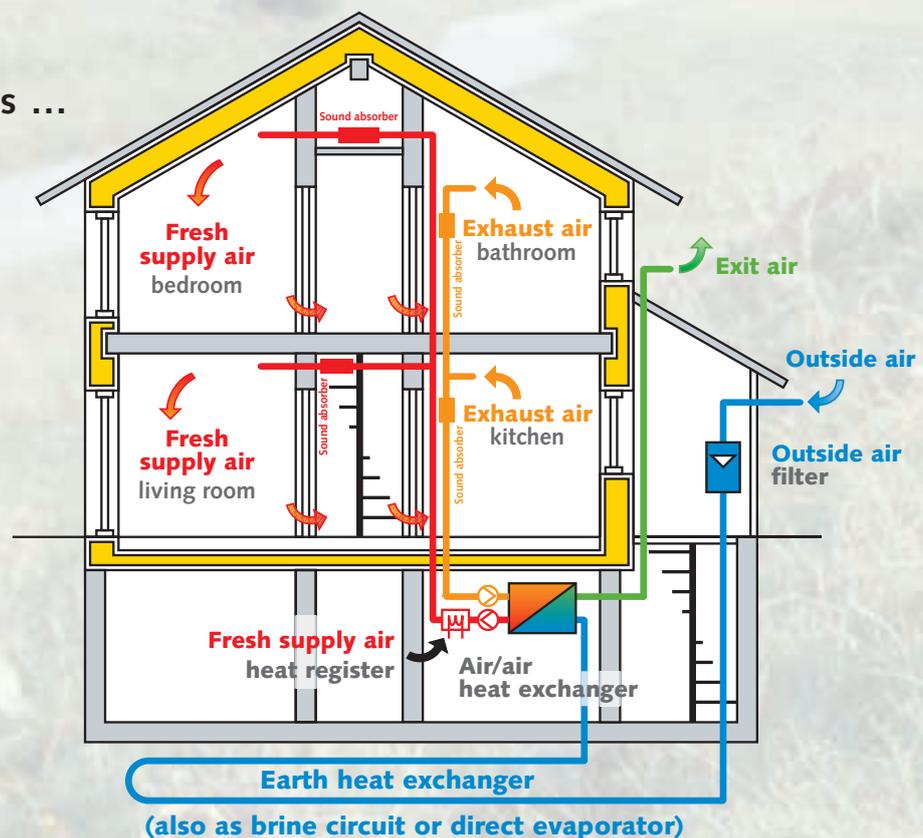
- for fresh air supply, primarily in living room, bedroom and children's room

- for exhaust air transport, mainly from kitchen, bathroom and WC
- for heat distribution and recovery in the entire house.

Completely different from traditional window ventilation, the air in the Multi-Comfort House always remains fresh – automatically! Without the help of obliging neighbors.

## Breathe in the advantages ...

- Healthy fresh air, free from pollutants, pollen, aerosols etc.
- Constant air humidity which prevents the penetration of moisture, mould formation and structural damage
- No bad smells as the directed air flow prevents polluted air from mixing with fresh air
- No draft air
- No temperature fluctuations
- Window ventilation – only if desired
- Highly efficient heat recovery

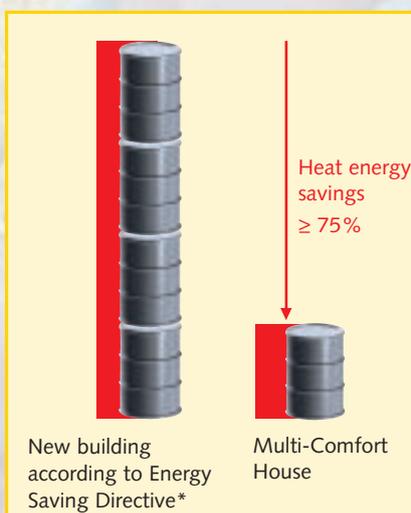
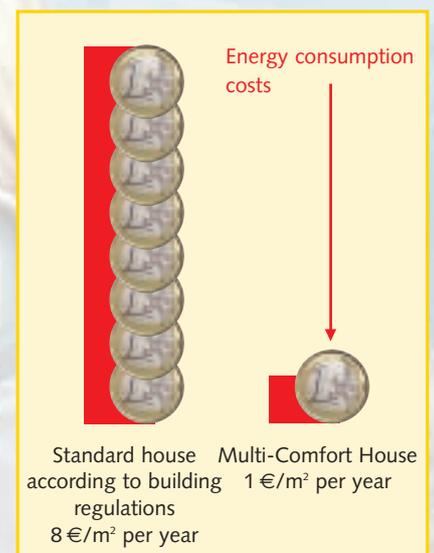


# efficient: comparable to a health resort.

## High living comfort achieved with little heating.

Buildings constructed today only according to the latest energy saving guidelines are already out of date and uneconomical. The passive house standard sets a level of energy efficiency which goes far beyond those stipulated by official guidelines. To enjoy a snug 23°C inside with outdoor temperatures of -10°C, a couple of tea lights would be sufficient to warm up the room.

It is thanks to its excellent thermal insulation, high-quality glazing, controlled ventilation and highly efficient heat recovery that the Multi-Comfort House almost always remains snugly warm indoors.



\* Example Germany 2001

## Low energy consumption – low costs.

The most favorable energy is the one that is not consumed in the first place. On this principle, the Multi-Comfort House allows to make savings in heating energy of about 75% – compared to regulations – without having to compromise your demands for comfort.

# The open secret of succes comfortable liv

## Encased in an airtight shell: airy and warm, like in a down sleeping bag.

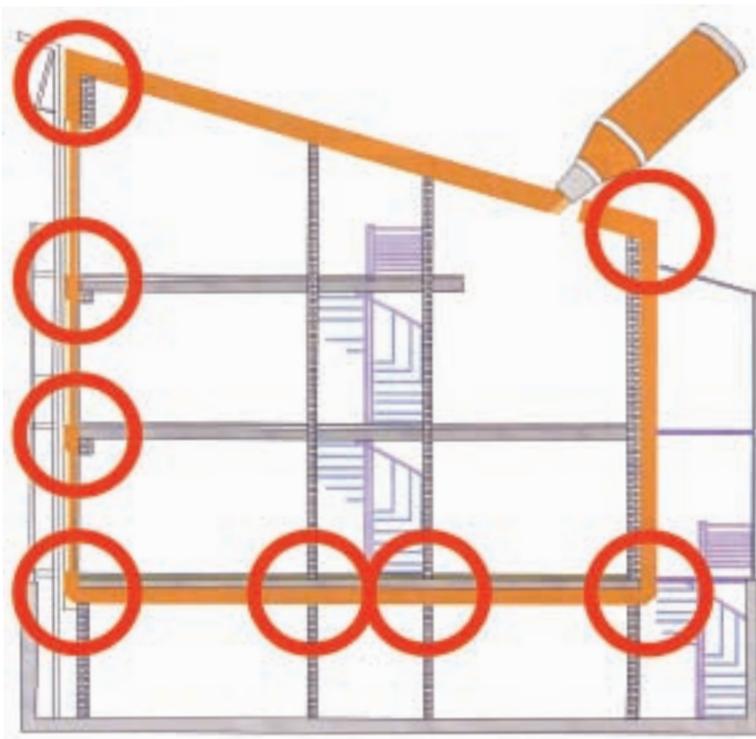
A Multi-Comfort House is always encased in a seamless shell, providing protection against cold, heat and noise. The occupants enjoy a constant healthy and comfortable climate, independent of the season. The directed air flow alone ensures the pre-selectable, demand-oriented supply of fresh air and heat. This, of course, makes high quality demands on

the building's construction, insulation and structural junctions. The building shell must be sufficiently airtight so as not to allow the accidental and unwanted entry or exit of air anywhere. The joints and gaps typical of conventionally built houses have no place in a Multi-Comfort House.



## Challenging demand: as few thermal bridges as possible.

Ideally, a passive house would be built without any corners, edges, junctions and conduits. For these are the places where a higher heat loss via thermal bridges can be expected. Through careful planning and execution of structural connections in the Multi-Comfort House, thermal bridges can be avoided to a great extent.



# s for ing: air-tightness.



## **Crystal-clear advantages: insulated window frames and heat protection glazing.**

It goes without saying that the windows in a Multi-Comfort House are also there to let in light, allow a view of the outside and be opened just when you fancy. Equally important is the heat gain they produce. This is because they function as solar collectors which in winter allow higher levels of solar energy, and thus heat, to penetrate the building than are lost to the outside. This bonus not only saves energy and costs, but also promotes an agreeable and healthy indoor

climate. There is a good reason for this. Windows in passive houses are equipped with high-quality multiple heat protection glazing. And also the frames are thermally insulated. This reduces the amount of thermal loss by approx. 50 %, compared to customary frames. Even on cold winter days the temperature on the interior window surface does not fall below 18 °C. Simply pleasant: today, you can also enjoy the same comfort near the window as anywhere else in the room.

## **Pleasant warmth – both in winter and summer.**

What protects well against cold also helps against excessive heat. For this reason, larger fluctuations in temperature are practically non-existent in passive houses. Nevertheless, the largest window area should be orientated south if there is optimum scope for planning. This results in a maximum utilization of solar energy in winter. And protects against excessive heat in summer.

# The crucial energy saving is invisible:



U-values of 0.10-0.15 are desirable for thermal insulation of outdoor structural components.

# factor thermal insulation.

As often in real life, the true heroes work undercover. This fact also applies to the thermal insulation of your home. But it is exactly this fact that assures extra comfort while at the same time cutting down on heating costs. And as it produces a well-balanced and pleasant room climate, thermal insulation eventually also promotes our health.

Thermal insulation can, however, only be exploited to its full potential if insulating materials of optimum thickness are employed. Optimum thermal insulation is hence the basis for state-of-the-art house building. At the end of the day, insufficient thermal insulation produces much higher heating bills than can later be compensated by the installation of sophisticated energy generation systems, as for example solar cells. Thick insulation layers thus generate savings in the right place.

## Low effort – high impact: the principle of thermal insulation.

The pioneer of insulation is probably known to everyone: the thermos flask. Once in the flask, the hot liquid is kept nicely warm for a long time. Technicians call this a “passive” solution. The desired aim is reached without need for additional energy – just passive, not active.

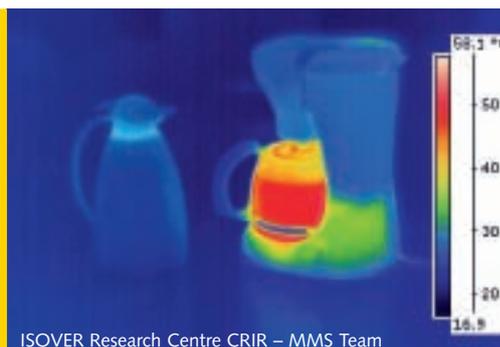
The passive house concept also forms the basis for the energy-efficient ISOVER Multi-Comfort House.

## Thermal insulation to ensure high environmental and climatic protection.

The math is quite simple. Optimum thermal insulation helps not to consume large amounts of energy in the first place. And energy that was not consumed did not have to be generated or imported. As a result, no air pollutants are produced and humanity and the environment are protected from further harms.

Every one of us can thus actively contribute to environmental protection while at the same time benefiting from increased living comfort and lower heating energy cost. As good as it gets.

*Modern comfort:  
keeping warm without  
energy consumption.*



# From nature – for nature in

Optimum thermal insulation produces the highest energy savings. But it should also meet the highest demands with respect to workability, quality and in particular ecology. ISOVER is committed to fulfilling all these criteria and has developed the appropriate products: ISOVER glass wool and stone wool. Glass wool, for example, is manufactured from sand which is found in almost unlimited supplies in nature.

Extraction is easy on the environment: the natural raw materials are only produced in small open-cast mines where greening starts immediately after completion of work. Afterwards, modern production processes assure that also the next steps are environmentally sound. The result: an extraordinarily favorable ratio between production energy invested and energy savings realized, thus achieving an excellent CO<sub>2</sub> balance.



**Energy-efficient living.**

## **ISOVER mineral wool products – safe insulating materials.**

When using natural raw materials as a base for production, the properties of the finished product will also convince. This is what ISOVER products do. They are:

- safe in application and use
- not classified as carcinogenic under Directive 97/69/EC of the European Commission
- free of propellants and pesticides
- chemically neutral
- excellent with respect to their thermal, acoustic and fire insulation properties
- very economical, especially when using thick layers of insulation
- non-combustible
- free of flame-retardant, ground-water-polluting chemicals
- durable and rotproof
- diffusion-capable



*ULTIMATE, the new high-performance glass wool insulant by ISOVER.*

# e: insulating with ISOVER.



## ISOVER products – Exceptionally convenient handling.

The advantages of ISOVER glass wool are not limited to later savings in energy, but already become obvious during installation. Here, the material shows its strengths, also under economic points of view:

- 75 % storage and transport savings due to high compressibility
- dimensionally stable, high tensile strength
- no waste
- straight off the roll onto the wall
- multi-purpose, reusable, recyclable
- easily disposable

## ISOVER glass wool – Recycling the easy way.

The name says it all: ISOVER glass wool consists of glass. Ideally, this needs not be new, but is taken for the most part from recycling sources in an environmentally friendly way. For this reason, ISOVER glass wool consists up to 80 % of recycled materials. An exemplary approach to environmental protection.



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