

PVC TODAY

ENGLISH VERSION
OF STARKE SEITEN

MAKING POSSIBILITIES TOGETHER — SPRING 2008

Up High:
The Most Powerful
Wind Turbine in the World

Highly Talented:
Designers on a New Path

Highly Durable:
Pipes under Continuous Stress

Energy
OUR VALUABLE RESOURCE

Energy Efficiency: Future Topic Number One

About 40 percent of worldwide energy consumption can be attributed to buildings, according to the International Energy Agency (IEA). This extremely high percentage could be drastically reduced through appropriate measures in constructing new buildings and efficiently modernising existing ones. In Germany alone, savings in heating costs of about €50 billion could be possible by 2020 based on the findings of the first national CO₂ building report. PVC products can provide a significant contribution to meet this objective. This is evident through forward-looking projects with impressive results.

The district of Ozzano Emilia, near Bologna, places great emphasis on environmental protection and the economic use of energy. Their ambitious goals are reflected in new guidelines on saving energy and resources, as well as incentives for environmentally-compatible new buildings. Moreover, this Italian district has designated a special

area for new buildings which must fulfil strict requirements in terms of energy and water consumption, safety systems, and waste management. The Studio Arkit of Bologna is now implementing the pilot project '2 litre house' there. Supported

by the Centro di Informazione sul PVC (Italian association of the PVC industry) and AIPE (Italian association of expanded polystyrene producers), five new residential units will be built by summer of this year with a total of 400 square metres of space.

Forward-Looking Architecture

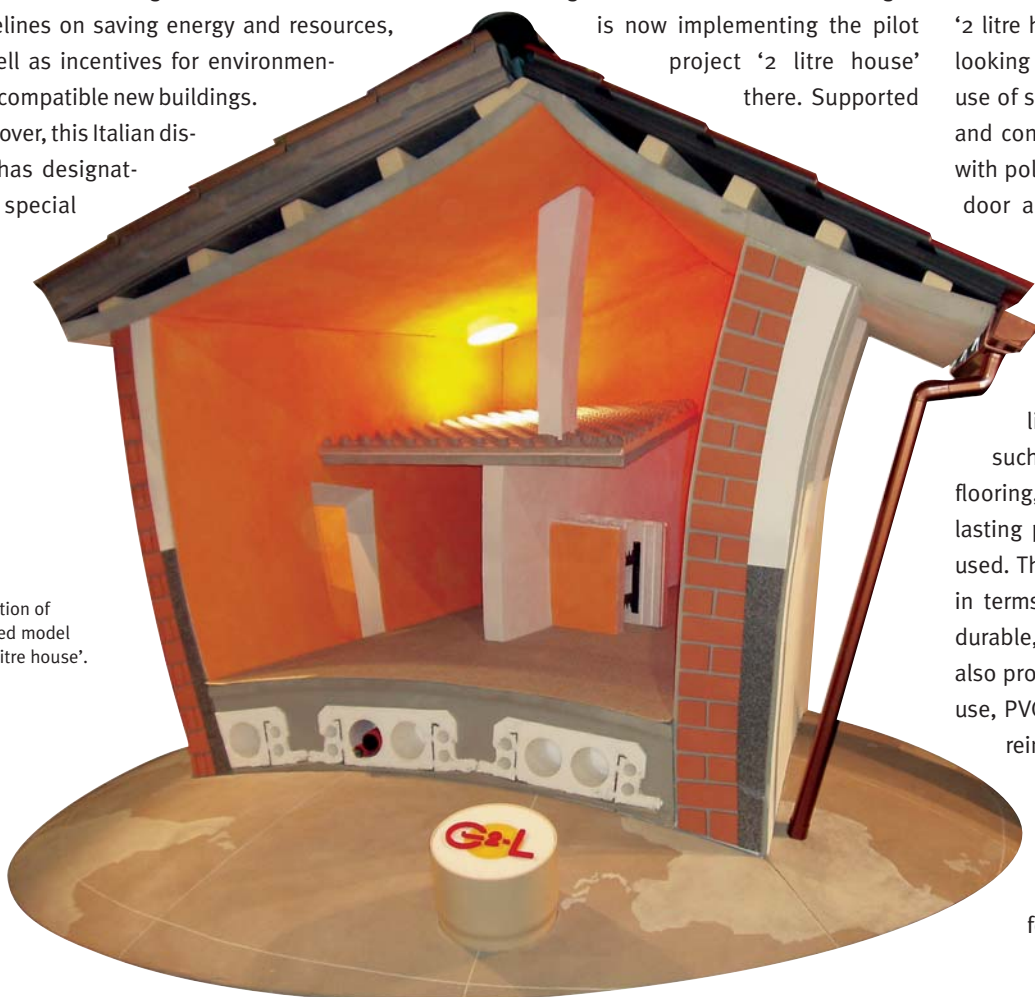
The goal of the project is to drastically reduce impact on the environment during the construction and lifespan of buildings. The demanding architectural strategy of the '2 litre house' is supposed to reduce the consumption of fossil energy to only two litres per square metre a year for heating, air conditioning, and hot water. This would correspond to an energy saving of about 90 percent compared to Italian homes, which on average use 20 litres per square metre a year. The '2 litre house' combines a variety of forward-looking technologies under one roof from the use of solar energy, to the use of heat pumps and controlled ventilation, to heat insulation with polystyrene foam sheets. Extremely tight door and window profiles made from PVC with triple-glazing and a U-value of

$1\text{W}/\text{m}^2\text{K}$ are also essential. They enhance the spacious easy-to-clean glass façades of the residential units and allow plenty of light to enter. Other PVC products such as insulating membranes, durable flooring, practical shutters, and robust long-lasting pipes for transporting water are also used. These solutions yield high performance in terms of sustainability. They are not only durable, easy-to-clean and cost-effective, but also provide great comfort. At the end of their use, PVC products can be easily recycled and reintroduced as new products. For this reason, numerous independent studies consider PVC to be an ecologically efficient plastic material and attest to its sustainable advantages for society during its entire life-cycle.

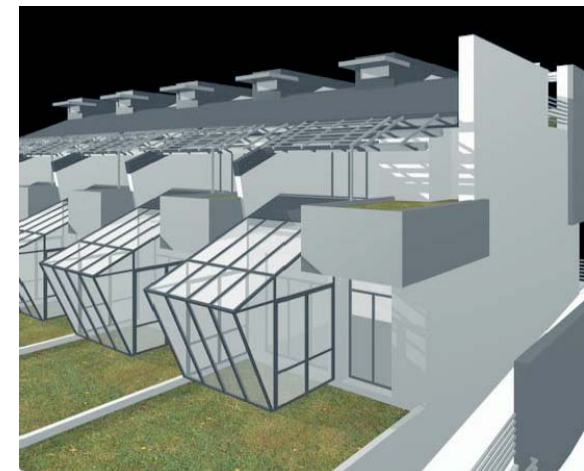
The potential for savings is also enormous through energy-efficient building improvements. According to the IEA, the overall energy consumption can be reduced by half in existing buildings through optimal energy-efficient improvements and modernisation. For this reason, the German federal government is supporting this initiative with grants and low-interest loans which are guaranteed until 2011 as part of the CO₂ building modernisation programme. In Switzerland, the "Climate Cent Foundation" also provides financial support for improving old buildings.

Energy-Efficient Modernisation

The installation of new thermally insulated windows plays a decisive role in the process. According to estimates by the Associa-



Cross section of a simplified model of the '2 litre house'.



tion of Window and Façade Manufacturers in Frankfurt (VFF), less than 40 percent of the 560 million window units in German buildings have thermally insulated glass in line with currently available energy-efficient technology. In Germany alone, approximately 340 million windows have to be modernised or replaced, 30 million of which are single-glazed. "The modernisation of outdated windows is cli-

Photos: Centro di Informazione sul PVC/Studio Arkit

Full Power

For our modern civilisation, the rapid and unobstructed transport of water through clean pipes is indispensable. However, deposits can block the lines. This can be remedied through high-pressure cleaning which flushes the clogged pipes with water. PVC pipes with their smooth surfaces withstand this intensive strain amazingly well.

High demands on sewage systems pose great challenges for manufacturers. Easy installation, flawless operation for the entire life of the product, and low maintenance costs are only a few examples. Added to this is the extreme mechanical strain through high-pressure cleaning which sewage pipes must withstand without affecting their ability to operate. For this reason, the German company

Funke Kunststoffe GmbH from Hamm-Uentrop had the IKT – Institute for Underground Infrastructure – perform a test. "In the interest of our customers, we would like to test how the CONNEX sewage system made from PVC reacts during numerous high-pressure cleaning processes," stated Dieter Jungmann, Director of Drainage Products Division at Funke Kunststoffe GmbH.



FIRST VINYL 2010 ESSAY COMPETITION

CONTROVERSIAL THEME CHALLENGES YOUNG THINKERS

Sustainable development concerns us all but especially younger generations who know they are going to have to live with the consequences of decisions made today. To encourage deeper reflection, Vinyl 2010 – the European PVC industry's sustainability programme – challenged young EU citizens, aged 18-30, to write a maximum 1,300-words essay on the theme "Are sustainable development and economic growth mutually exclusive?"



Vinyl 2010 reaches out to partners at every opportunity as part of its commitment to dialogue and worked closely in this important project with academic organisations involved in environmental activities. These included AIESEC – the world's largest student organization – Environmental Data Services (ENDS) – a leading media provider of environmental intelligence – ESU – The European Students' Union and several universities around Europe. The independent Judging Panel brought together leading sustainable development experts from academia, NGOs and the media.

"We want to hear your views!"

The theme has no wrong or right answers. Ideas ranged from the need for more 'humanity', through the meaning, relevance and 'irrelevance' of economic growth to the experience of conflict in society. Respondents often questioned the most basic assumptions about material prosperity over the long term and what this means.

Seen as a set, the essays represent a new look at the sustainable development issue and it was Vinyl 2010's resolution to give it a voice. The essays are not only available online but readers can also comment and discuss them. Vinyl 2010 intends to publish the collected essays in a booklet for wide distribution to stakeholders.

The top three entrants received prizes from €3000 to €1000 and will have their submissions published in a special supplement of ENDS. The prize winners were:

- 1st prize: Maja Derčar (Slovenia)
- 2nd prize: Daniela Jungova (Czech Republic)
- 3rd prize: Francesco Falcone (Italy)

"The vision of these young people confirms the importance of a continuing dialogue and exchange of ideas on sustainable development" explained Chris Welton, Communications Manager of Vinyl 2010, "and we want to be a part of that debate." Based on the quality of the essays and the positive feedback from industry and partners Vinyl 2010 is now assessing the options for an annual competition.

To read the essays and for more information on Vinyl 2010 please go to www.vinyl2010.org.



The energy-efficient improvements of this high-rise building in the German city of Selb-Plößberg reduced the annual primary energy needs of 401 kilowatt hours per square metre a year to 25 kilowatt hours.

in Upper Franconia into a low-energy building, the annual primary energy needs of 401 kilowatt hours per square metre a year were reduced to only 25 kilowatt hours. Realised by the German Energy Agency as part of a model plan, the 18 two- and three-room flats of the building society now qualify for the energy efficiency class A. "The installation of new windows with very good thermal insulation from the GEALAN System S 8000 IQ enormously reduced energy consumption," says Bernd Wiederhold, Environmental Manager at GEALAN Fenster-Systeme. Along with improving the façade and the roof, replacing the windows was the major task of modernising the shell of this building.

Energy Efficiency as a Marketing Tool

Investment in energy efficiency is worthwhile and is becoming increasingly important as a marketing tool and a qualitative feature to boost the profitability of buildings. After all, energy efficiency increases the long-term marketability and market value. This is confirmed by Frank Junker, Managing Director of ABG Frankfurt Holding. A municipal building con-

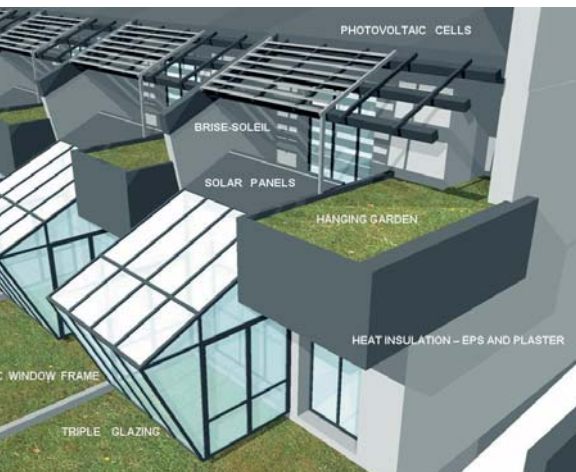
struction company with 50,000 flats, it concentrates on modern energy-efficient standards in constructing and modernising buildings and has achieved superior results in marketing its properties. The introduction of the Energy Pass for private residential buildings in Germany in the middle of this year will also lead to a rethinking of objectives. With the help of this new document, buildings can quickly be compared with one another in terms of energy, and high energy consumption will be immediately recognised. This is an invaluable advantage in the face of continuously increasing costs. According to the CO₂ building report, heating costs rose by an average of more than 40 percent between 1996 and 2006. A price increase of up to \$200 per barrel of oil by the year 2020 cannot be ruled out, according to the German Institute for Economic Research. Energy efficiency therefore remains a pressing concern. This is also true with respect to scarce resources and the widely discussed topic of climate change.

www.pvcforum.it, www.casa2litri.it, www.gealan.de, www.window.de

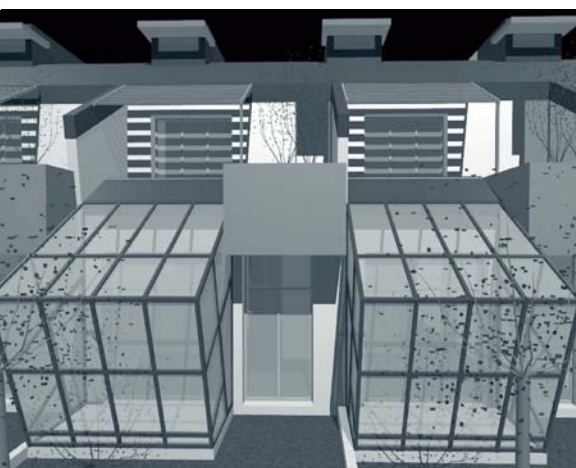
mate protection with perspective," states Ulrich Tschorn, Managing Director of VFF.

Enormous Savings Possible

This is made even clearer by another example from Germany. By converting a high-rise building constructed in 1972 in Selb-Plößberg



Drafts of the pilot project '2 litre house' in Italy. The innovative architectural strategy allows for energy savings of 90 percent.



The water was forced through the pipes with up to 120 bar.

the pipes prepared in this way to 300 cleaning cycles. Common cleaning machines, rinsing hoses, and various high-pressure nozzles forced up to 320 litres of water per minute through the line with a maximum pressure of 120 bar. It was an enormous strain which exceeded the norm and provided customers with completely reliable information about the high-pressure cleaning resistance of the pipes. As it is, high-pressure cleaning is generally only necessary once every five years.

Extremely Durable

A visual examination of the pipe surfaces and connections showed that Funke's tested PVC

pipes did not reveal any noteworthy changes in the material after more than 300 high-pressure cleanings. Minor cleaning and abrasive marks at the bottom of the pipes did not have a significant impact: The changes observed in the material did not have an effect on the density and durability of the test specimens, concluded Roland W. Waniek, Managing Director of IKT. The test results received the 'IKT Tested' seal of approval by the IKT. For the internationally operating pipe manufacturer, this is further proof of the efficiency of its PVC pipe system. "We have already received licensing from the German Institute for Building Technology for the CONNEX sewage pipe system. Together with the positive test results from the high-pressure cleaning, we offer customers and users a high level of security," stated Jungmann.

www.funkegruppe.de, www.ikt.de

This PVC pipe did not reveal any noteworthy changes in the material after more than 300 high-pressure cleanings.

With 120 Bar through the Line

For the test, the IKT re-created the situation of high-pressure cleaning and built an approximately 26-metre-long above ground test track with CONNEX sewage pipes. They were equipped with a reinforced interior wall compared to the norm and a firmly integrated gasket for extreme stress. In the process, seven pipes with a nominal width of DN/OD 800 and a wall thickness of 23.3 millimetres were connected to a pipeline. In total, the test track consisted of six pipe connections. In order to simulate various grades of deposits, the PVC pipes were first prepared with various levels of deposits from model sediments, which amounted to 15 and 45 percent of the diameter of the pipe. The Institute subjected

TIME TO ACT

The prices of oil, gas and electricity have never been higher. And the end is not yet in sight. As the German Institute for Economic Research reported at the end of the year, oil prices may very well reach \$200 a barrel by 2020. Faced with drastic inflation rates and intensive discussions on climate change, no one can avoid the topic of saving energy. Even if participants at the Climate Change Conference in Bali could not agree on specific quotas to reduce CO₂ emissions, it is a fact that a major reduction in the global emission of greenhouse gas is absolutely necessary. In the process, even small steps lead to enormous results. Private households could save up to one quarter of their energy consumption through the use of energy-efficient devices and the correct use of household appliances. This would bring about a clear reduction in CO₂ emissions without foregoing comfort, according to the German Energy Agency (dena).

The use of innovative materials also offers a wide range of possibilities for the building industry. The pilot project '2 litre house' in Italy shows that 90 percent of the previous energy consumption could be saved. PVC window profiles with efficient thermal glass contribute to this drastic reduction. Energy-efficient building improvements are also extremely important, as our example in the southern German town of Selb-Plößberg near Kulmbach illustrates. The conversion of a high-rise building into a low-energy building allows for a reduction of the annual primary energy needs of 401 kilowatt hours per square metre a year to only 25 kilowatt hours. Modern PVC windows with excellent thermal insulation also contribute greatly to these remarkable results.

Furthermore, the enormous innovative potential of PVC material in many other fields can be seen in this issue in other articles on unusual designer objects, forward-looking developments in nanotechnology, and extreme stress tests for PVC pipes.

We hope you enjoy reading the articles and look forward to your suggestions and ideas for topics, as well as your feedback!

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Into the World of Nanotechnology

Intelligent packaging films with security protection and freshness indicators are likely to be accomplished in the near future using nanotechnology. Companies are testing a new range of applications every day. The advantages of the future technology have become obvious since the invention of the lotus effect for keeping surfaces clean.

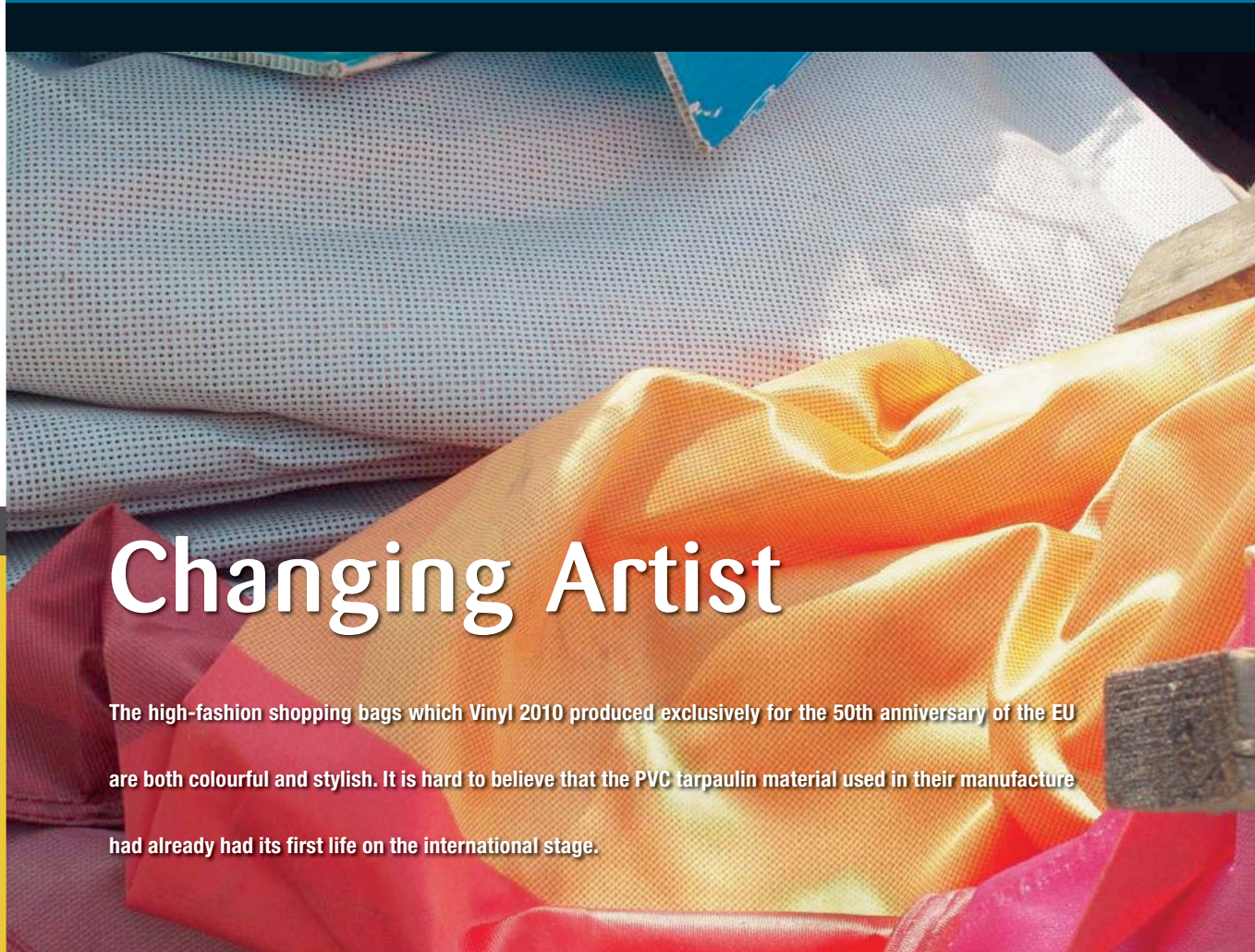
The demands on packaging films are continuously growing and can't be met any more by a mono film," states Dr. Christian Kohlert at the German company Klöckner Pentaplast. Here are some examples: food packaging films protect the shelf life of packaged goods through antimicrobial agents and oxygen barriers. In the electronics industry technical film for packaging diverts undesired static charges through its low surface resistance. Additionally, better printing results can be achieved by film with increased surface tension since the colour becomes more adhesive.

Additional New Functions

New qualities for products are always in demand. Many of these are realised through processing or coating the film with special nanoparticles. For many years, Klöckner Pentaplast has researched the use of this technology in thermoplastic film made from various

polymers, e.g. PVC. In particular, the subject of the studies has been the application of these minuscule parts on and in the film as homogeneously distributed components. In the process, calendaring and extrusion processes as well as customary coating methods are used. "We already have the first results of the use of various pigments in PVC film which radiate under the influence of light. In the long run, various spectrums can be made visible in order to specify goods and customer orders," states Dr. Kohlert. In the food industry, innovative packaging films with colouring pigments will provide information about the condition of the packaged goods. With the help of freshness indicators, long interruptions in the cooling chain will be recognised based on a change in the colour. The improvement of water vapour barriers of up to 40 percent and the antistatic treatment of films for transport trays is also possible through the processing or coating with nanoparticles.

Photo: Klöckner Pentaplast



Changing Artist

The high-fashion shopping bags which Vinyl 2010 produced exclusively for the 50th anniversary of the EU are both colourful and stylish. It is hard to believe that the PVC tarpaulin material used in their manufacture had already had its first life on the international stage.



This beautiful designer shopping bag was made from PVC banners from the 2006 Winter Olympics in Turin.



The organisers of the seven towns and the three Olympic Villages used a multitude of PVC applications to properly set the tone for the Olympic Winter Games in Turin. No matter whether banners, maxi-posters, flags or signs: PVC products were present everywhere and provided the 2006 Winter Games with an unmistakable visual identity through the use of distinctive outdoor graphics. 38,000 square metres of elasticated PVC tarpaulins were attached to the façades of build-

Photos: Vinyl 2010

Practical Solutions

The lessons learned from the miniscule parts have opened up a multitude of possibilities in refining film for various applications. However, they pose great challenges for science at the same time because a coating created

in a laboratory environment is not necessarily achievable in industrial production. After all, nanotechnology deals with very small nanometre structures which measure only one millionth of a millimetre.

www.kpfilms.com



Antistatic packaging for sensitive components in the electronic industry are continuously gaining importance.

ings. More than 7,000 PVC banners inside and outside the grounds advertised the major sporting event on a surface of 22,000 square metres. And these are only a few examples of the versatile use of the plastic material.

Recycled into fashion accessories

From a sustainable perspective an important goal of the organisers was to plan the Olympic Winter Games to avoid unnecessary waste. With financial support from Vinyl 2010 (the European initiative for the sustainable development of PVC products), all the PVC material was therefore collected after the international sporting event: amounting to some 20 tonnes in total. Vinyl 2010 had some of the PVC banners made into exclusive handbags with the help of top Belgian designers from the exclusive Delvaux fashion house. And you really can't tell that they were made from used PVC tarpaulins. Commissioned for an event to celebrate the 50th anniversary of the EU in October 2007, Vinyl 2010 managed to

provide both an impressive example of the sustainable potential of the material and, at the same time, it illustrates the unlimited creative potential for reusing PVC material for new applications.

No Horse Play

Another portion of the collected material was made into plastic flooring by the Jutta Hoser plant in Germany. The material provides horses with secure dry footing on equestrian arenas and race tracks and also is designed to be completely recycled again for a third life after this second use. This is another example of the numerous possibilities of bringing new life to used PVC products. A possibility realised through collection systems being implemented across Europe already for the most important PVC building products such as windows, flooring, pipes, roofing and waterproofing membranes, and coated textiles.

www.vinyl2010.org, www.ecvm.org

Maxi-posters and flags properly set the tone for the 2006 Winter Olympics in Turin.



Michael Mussotter, known for his alternative teaching methods, together with his students at the Berlin Technical University.

IN MEMORIAM

Michael Mussotter shaped Berlin's architectural scene more than almost anyone else. This is evidenced in a very insightful publication about this exceptional architect who unfortunately died much too young.

As a teacher at Berlin Technical University, Penn State University and Texas Technical University, Mussotter always encouraged his students to critically examine current models of architecture and urban planning. The publication 'Michael Mussotter: Ridin' Low', supported by PVCplus, now provides new insight into his life's work. Edited by Thilo Fuchs, Petra Vondenhof and Kai Vöckler, the book is based on a concept that Mussotter outlined with the editors before he died. His alternative teaching methods at the Berlin Technical University are presented for the first time with previously unpublished material. The book features topics such as constructing new buildings and modernising existing ones, suburban architecture and culture, and the importance of plastics for contemporary material aesthetics. The fact that Mussotter enjoyed experimenting with plastics is also reflected in his contact with PVCplus. For example, in 2001 he took part in the architectural workshop 'place.future: less is more', where 22 international architects, artists, and landscape designers developed alternatives for 'declining town populations'. The new publication with 240 pages is available in German as a hardcover from Vice Versa publishing house in Berlin and costs €19.80. ISBN 978-3-932809-60-6.

www.vice-versa-vertrieb.de



Proudly presenting the 'oldest plastic window in Germany': (from left) Marion and Wolfgang Nötzel, Hans-Joachim Grote (Lord Mayor of Norderstedt), Bernhard Helbing (President of the Association of Window and Façade Manufacturers) and Michael Vetter (Managing Director of Rewindo).

AS GOOD AS NEW

'Ganzplastic' ready-made windows from a single-family house in Norderstedt built in 1968 won the competition 'Oldest Plastic Window in Germany'. These windows are testimonies to the early days of plastic window technology and are impressive proof of the reliability and long life of PVC profiles.

The development of plastic windows started worldwide over 50 years ago. To find out whether products from this time are still in use today, Rewindo Fenster-Recycling-Service GmbH and the Association of Window and Façade Manufacturers in Frankfurt (VFF) launched their competition in March 2007. Nötzel Fenster-Türen GmbH based in Norderstedt discovered the genuine antiques and convinced the panel with 'Ganzplastic' ready-made windows from rigid PVC. They have been functioning perfectly for around 40 years now. For their detective work, Marion and Wolfgang Nötzel received more than just the winner's certificate from Michael Vetter, Managing Director of Rewindo, and Bernhard Helbing, President of VFF. They are also allowed to dispose of their old PVC windows free of charge through the recycling system organised by Rewindo across Germany. It soon was clear to the Plastics Museum in Troisdorf that the intact windows are some of the oldest completely-preserved plastic building elements in existence. That is why one of the windows will be sent straight to the Museum in the Rhineland. In addition to showing various other historical plastic products, the exhibition is displaying one of the first plastic windows ever from 1954 – at that time made of non-rigid PVC – and another well-preserved casement window of the TROCAL TF 100 profile type from 1968.

www.rewindo.de, www.window.de, www.kunststoff-museum.de

For Maximum Demands

The possibilities for design are often limited by existing structures when modernising buildings. But high demands for quality, aesthetics, and style should not suffer as a result. That is why the careful choice of materials is so important. This is evident in the modern conference and seminar centre in Cologne. Through the use of PVC flooring, the owners of the building were able to implement their ideas optimally in every respect.

Elegant, tranquil and friendly: that is the impression conveyed by the six conference rooms at the new Gut Keuchhof seminar centre in Cologne. Dark brown floors with the look of wood play a key role in providing a pleasant atmosphere in the tastefully furnished rooms. Only at second glance do visitors notice that the floors are really high-quality flexible PVC flooring: "Actually, people talk to us about the floors a great deal," says Sandra Baggeler, whose family acquired the 6,000-square-metre Cologne estate in 1980. "They are all surprised when they learn that it is PVC."

Convincing Properties

Renovating the six seminar rooms of various sizes meant thoroughly modernising the 400-square-metre first floor of the barn. The work included the long overdue renewal of the floor foundations. This resulted in an elevated foundation that permitted a maximum thickness of only 3 millimetres for the floor covering, which many materials exceeded. Added to this were high demands for noise insulation and the durability of the heavily used floors. And the design also had to harmonise with the overall concept. Sandra and Annelie Baggeler therefore decided in favour of the easy-to-clean PVC flooring EXPONA art + design from the company objectflor. The flooring was convincing not only because of its thin profile, high-noise insulation, and toughness. The authentic appearance of rustic dark-brown wood, which forms a strong contrast to the

Dark-brown PVC flooring with the look of wood enhances the atmosphere of the new seminar centre in Cologne.



The flexible flooring material was also used to cover the comfortable benches.

also covered in the dark-wood look of PVC. This repeated use of the material provided an overall harmonious and calm atmosphere.

light walls of the modern rooms, was also decisive. But Sandra and Annelie also used the flexible PVC flooring material in other areas as a design element. For example, they

covered the benches built into the niches with the elegant PVC coverings: this is a visually attractive solution which protects the sensitive masonry from dirt. The windowsills were



The new Gut Keuchhof seminar centre was the last building to be renovated after acquiring the large estate in Cologne. Meticulous work over the last few years has made the dilapidated, historically-preserved buildings from the 19th Century into a modern complex with a hotel, restaurant, café and brewery.

www.objectflor.de

Photos: objectflor/Anna Silvia Bins

MOST POWERFUL WIND TURBINE IN THE WORLD

At the end of 2007, Enercon built the most powerful wind turbine in the world near Emden. The new power plant should generate 20 million kilowatt hours of electricity per year. That is enough to supply over 5,000 four-person households with power. The rotor blades of the new E-126 prototype were made from cross-linked PVC foam.

With the new E-126 wind turbine, Enercon (Germany's largest manufacturer of wind power plants) has further developed its existing E-112 wind turbine. In addition to increasing its efficiency, new features include larger rotor surfaces, a new blade design, and a higher tower. The power plant is 131 metres tall and is therefore exactly the same height as St Peter's Basilica in Rome. 1,100 cubic metres of concrete were needed for the tower alone. Another 1,500 cubic metres of the same material and 180 tonnes of reinforced steel were also used in the base. To safely secure the new large-scale installation, the builders of the foundation drove 64 posts into the ground with an average length of 25 metres and a diameter of 56 centimetres

because the soil on the washed-up banks of the Ems River is very soft.

Efficient Rotor Blade Design

One innovation of the powerful wind turbine is its rotor blades which feature a metal surface. They have to withstand extreme loads with their gigantic dimensions. Sandwich constructions with a PVC core thus ensure the stability and strength of the enormous blades. It is closed-cell, cross-linked AIREX® C70.55 PVC foam made by the Swiss company Alcan Airex which is often used in rotor blade construction due to its stiffness and toughness. Incidentally, it is also used for rail and road vehicles, in ship and boat building, as well as in aviation and space travel. The PVC structural

foam is the ideal core material for sandwich structures which are lightweight, dynamic, or subject to static loads. This also applies to rotor blades which are resistant and durable with comparatively low weight.

To Be Continued

A second mega wind turbine of the E-126 type will be built right next to the first one near Emden. Both are part of a research and development project in which Enercon intends to test various storage technologies in combination with the multi-megawatt plants. Furthermore, another five wind turbines of this type are to be launched this year.

www.enercon.de, www.alcanairex.com

Photo: Enercon GmbH

New Appearance for Façades

When a façade starts to age, many people reach for the paint and brush to freshen up its appearance. But often a new coat of paint is not enough because the render has become weathered or cracked over time. An easy-care and attractive solution is provided by façade panelling with profiles made of wood plastic composites (WPC) which are protected by a plastic film containing PVC.

Anyone who has to renew render on a façade is mostly put off by the tremendous amount of work involved and the high costs. But applying new render does not change the previous amount of maintenance. There have long been other alternatives to renovating the face of a house. The German company Kosche Profilummantelung GmbH has developed the innovative Kovalex Panelling System made of WPC profiles for both modernising and building new homes. These are façade profiles made of wood fibres enhanced by a two-layer Renolit MBAS plastic film. Launched 25 years ago by Reno-

lit (an internationally leading manufacturer of high-quality plastic films and products), these films were the first to make possible the use of plastic profiles with colour.

Long-Lasting Protection

The attractive façade panelling protects the external wall against weathering for a long time and can compensate for deficits caused by cracked or damaged render. Moreover, it improves a house's energy balance, particularly in combination with façade insulation. The plastic coating is especially important.

The bottom PVC layer is coloured all the way through and sometimes contains a colour-printed wood grain. The colours and the grain are protected by the transparent resistant top layer made of polymethyl methacrylate (PMMA), which absorbs over 95 per cent of the UV rays and therefore works as a sun protection factor on the profile. "Thanks

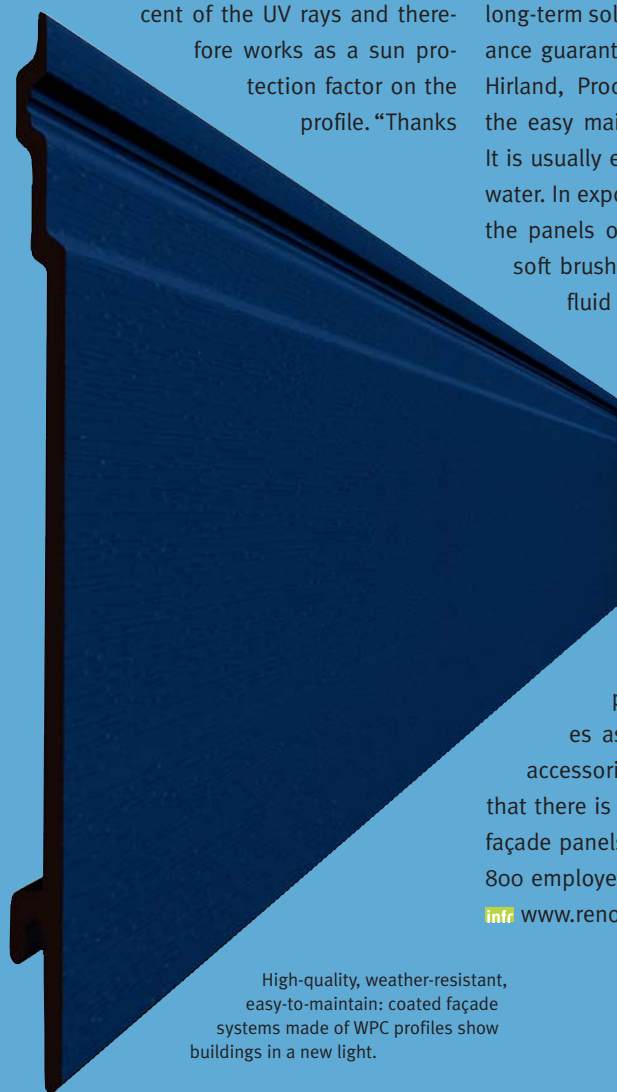
to its high UV resistance, the film is not only colour-fast for its whole service life, it also protects the carrier material," states Sibylle Kahl, Sales Manager for the Renolit EXTERIOR division. It is an important quality feature for Kosche: "We would like to offer builders a long-term solution and give a 10-year performance guarantee on our products," states Ralf Hirland, Product Manager. Added to this is the easy maintenance of the façade system. It is usually enough just to hose it down with water. In exposed areas it is sufficient to clean the panels once a year with a sponge, or a soft brush and neutral household cleaning fluid or soap.

More Colour for the House

Since early 2007, WPC profiles have been available from timber and builders merchants and DIY stores in five different colours in lengths of three, three and a half, and four metres. The range also includes transition profiles for corners and surfaces as well as the appropriate fitting accessories. Positive sales figures show that there is a growing market for the coated façade panels from the company with around 800 employees.

www.renolit.com

High-quality, weather-resistant, easy-to-maintain: coated façade systems made of WPC profiles show buildings in a new light.



SIGNPOSTS INTO THE DEPTHS

Traffic signs tell us exactly how we have to behave as pedestrians or motorists. Almost everyone knows what they mean. However, we hardly notice any other signs in our landscape because we do not understand them. These include the thin yellow PVC posts with formulas for identification made up of letters, numbers and lines.

The gas pipeline between Scheidt and Lauterbach which was put into service this year in Germany is approximately 125 kilometres long. It carries Russian gas for export to the UK. Not much is left to remind us of the extensive excavation work that was necessary to lay the gas pipeline in the ground if we ignore the thin plastic posts installed all along the pipeline at intervals of approximately one kilometre. They provide important information about the direction of the pipeline in order to prevent damage to the sensitive life-

line by digging into the ground. Furthermore, some of the thin posts function as testing points with state-of-the-art technology. They show whether the pipelines are working efficiently. Connected to the pipeline by a cable, they measure the low-voltage current flowing through the one-metre-thick metal pipeline. A reduction in current indicates damage to the covering. For the network operator, this is an urgent indication to check the respective part of the pipe for corrosion.



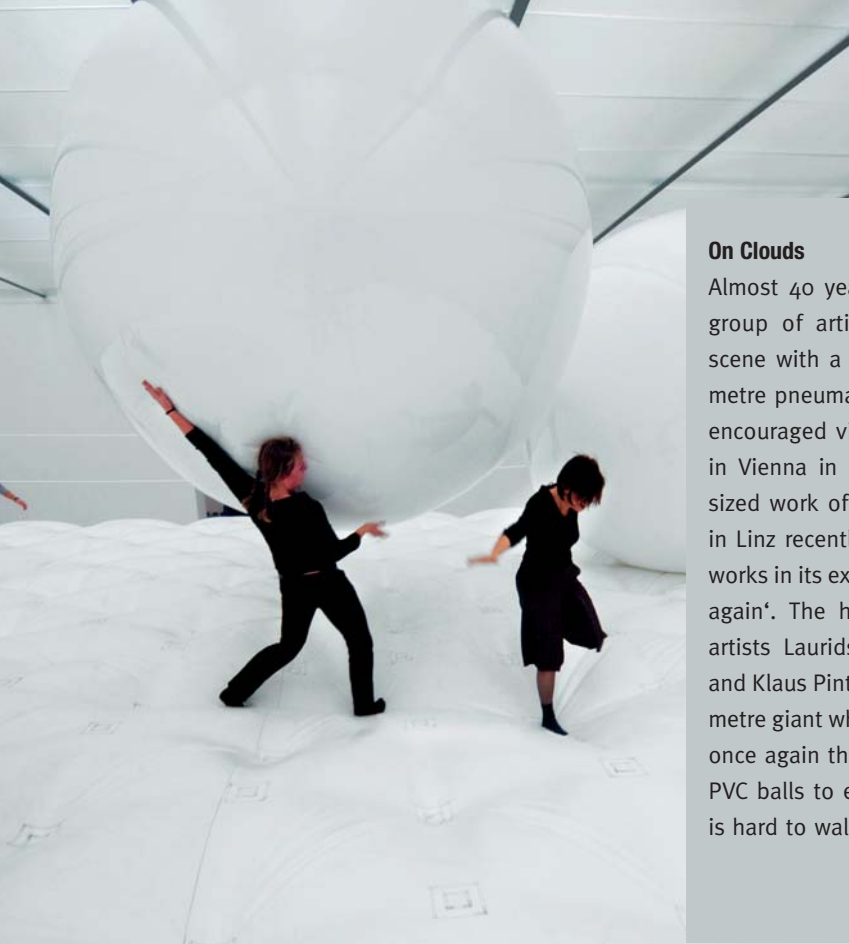
Testing point posts provide important information about the direction and condition of underground lines.

Obvious Advantages of the Material

"The demands made on the material and the construction of the testing point posts are extremely diverse," reports Günter Oster, Managing Director of Kettner. The German company from Villmar supplies large energy providers such as EON, Ruhrgas, RWE and

ENBW with signposts and testing point posts made of rigid PVC because this material offers many advantages. The decisive factor is the resistance of the PVC posts to corrosion and weathering. They are reinforced with an additional 1-millimetre-thick special coating which also ensures long colour stability. The self-extinguishing properties of PVC are also important. After all, the sensitive information suppliers are often located in the middle of fields or on the edge of woodland which can possibly burn. Weighing about nine kilograms and standing 1.8 metres above the ground, the PVC posts have the necessary stability and solidity to perform their services for many years. Numerous advantages speak for themselves. In November 2007, the Dutch gas supplier Gasunie switched over from its previous system to the signposts and testing point posts from Kettner in its supply area.

www.kettnergmbh.de



Visitors to the Lentos Art Museum in Linz playing with the giant billiard ball.

On Clouds

Almost 40 years ago, the Haus-Rucker-Co group of artists shook up the museum scene with a giant billiard ball. A 15 x 15 metre pneumatic mat with three PVC balls encouraged visitors to the LIVE exhibition in Vienna in 1970 to play with the oversized work of art. The Lentos Art Museum in Linz recently showed that this idea still works in its exhibition 'Haus-Rucker-Co Live again'. The heart of the homage to the artists Laurids Ortner, Günter Zamp Kelp and Klaus Pinter was again the 225-square-metre giant white billiard table. The visitors once again threw the gigantic feather-light PVC balls to each other on the mat which is hard to walk on.



The quickly inflatable NAPPAK sofa bed provides a regenerative nap in the office.

Sleeping on Air

A brief nap in the office increases performance, but is usually hard to get. Help is provided by the pneumatic NAPPAK, the creation of a group of four students of architecture and urban planning at Stuttgart University. The mobile bunk made of flexible PVC tarps can be quickly inflated by a compressor. A comfortable, semi-closed sofa bed emerges which looks like an airbed. After a "power nap," the bed is deflated at the push of a button and stored in a slim, round trolley that will fit in any corner. Incidentally, the students are still on the lookout for partners for the marketing and planned commercial production of the NAPPAK!



After 40 winks, the pneumatic bed disappears into a thin space-saving trolley.

Photos: www.nappak.de

Also attractive on its own: The giant billiard table as a flawless white sculpture.



Photos: Norbert Ortner

International designers and artists enjoy realising their unconventional projects with PVC. There are no limits to their creativity. Convince yourself.

Following New Routes



The new range of lighting from Louis Poulsen Lighting bathes rooms in a diffuse soft light.



Photos: Louis Poulsen Lighting

Gentle Illumination

Fresh design, innovative materials, diffuse lighting effects: with its new range of lighting, the Danish company Louis Poulsen Lighting is aiming precisely at the tastes of young fans of design. The double shades of the pendant and standard lamps, which resulted from cooperation with the young designer Christian Flindt, are made of a cylinder and the truncated cone of matt white vinyl string. The weaving technique of the extruded PVC ribbons gives a three-dimensional, transparent impression that forms different patterns depending on the angle of viewing. The head of the lamp, made of acrylic, provides a diffuse soft light that gently brightens the rooms.

The MSKYO designer trolley: the alleged shopping aid for the elderly conceals a powerful mobile hi-fi system.



Photos: Claassen & Partner



Rock on Wheels

At first sight, the MSKYO trolley seems to be a modern designer shopping trolley for the elderly. But far from it. The wheeled case from Claassen & Partner is furnished with a 250-watt music system with a MP3/CD car hi-fi tuner and top-quality speakers. A robust PVC-coated tarp with a trendy design protects the sensitive sound system. This is an attention-grabbing reminder of the good old "ghetto blaster" which is being revived by the young designers, Tammo Claassen and Sophie Birkmayer.

www.lentos.at, www.louispoulsen.com, www.nappak.de, www.claassen-partner.de