

INOVYN AWARDS FOR INNOVATION WITH VINYL

INOVYN
AWARDS
2016



inovyn
An INEOS company

DRIVERS OF INNOVATION

The first large scale commercialisation of PVC products was in the 1930s with the introduction of Vinyl records. Since then we have seen the global market for PVC polymer grow to over 40 million tonnes per year. The diversity of PVC applications reflects the versatility of the material and the ability to modify product properties with additives achieving an unmatched variety of performance and aesthetic characteristics.

PVC is often perceived to be a mature product, but the reality is that our industry continues with a strong tradition of innovation: around 70,000 PVC related patents have been registered during the last 10 years - this is about 40% of all the PVC related patents ever registered. The annual trend of PVC related patents registered is sharply increasing.

As Plato said, *“Necessity is the mother of invention”* and PVC products have developed and evolved to meet changing human needs and aspirations. Population continues to grow and we are witnessing changing demographics with an ageing population in developed nations, and more urbanisation worldwide. Population and demographic changes open new opportunities for PVC products and our industry is responding by creating new products that provide significant benefits in our changing world.

Sustainability is another key objective that is driving innovation in our industry. PVC products make a significant contribution towards meeting all of the 17 sustainable development goals identified at the UN Sustainability Summit in 2015. In Europe, the PVC industry has made a major commitment to sustainable development through the VinylPlus programme (to which INOVYN is a major contributor); VinylPlus is widely recognised as a leading example of how industry can respond to sustainability challenges (*“VinylPlus can be considered as a frontrunner*

for the circular economy”: Gwenole Cozigou, Director DG GROW, European Commission, May 2015). Sustainability objectives are also a big driver of innovation in our industry as can be clearly seen from the entries for tonight's INOVYN Awards, with 12 projects using recycled content, 6 projects related to new recycling processes, and 6 projects demonstrating new designs to facilitate recycling.

For the INOVYN Awards 2016 we were delighted to receive a total of 72 project entries from 17 countries across 5 continents. The level and the quality of the entries demonstrate once more that innovation is as powerful as ever in our industry. INOVYN is firmly committed to creating and supporting innovation in PVC, and the INOVYN Awards are one way in which we hope to achieve our aim of bringing the PVC value chain working closer together in order to better serve the evolving needs of our customers and society as a whole.

Innovation is the lifeblood of the PVC industry and we thank everyone who put forward an entry for tonight's awards, and all the other people and organisations who continue our industry's proud tradition of creativity and innovation across the world.



A stylized, handwritten signature in blue ink, likely belonging to Chris Tane.

Chris Tane
CEO of INOVYN

INOVYN AWARDS FOR INNOVATION WITH VINYL 2016

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JURY



Lena Johansson

“All industries need a roadmap to become part of the circular economy and a sustainable society. VinylPlus members has plenty of lessons to share in society”

Lena Johansson is a Senior Advisor at The Natural Step with 20 years' experience in the field of sustainable development. Lena holds a BA from Stockholm University School of Economics with focus on sustainability in the business sector.



Keith Watkinson

“A well supported process for encouraging new developments in PVC”

In 2103 Keith joined IOM3 and was heavily involved in the Materials KTN as Sector Leader for the Polymer Group. Keith read physics at University and after completing his PhD he did post doctoral research at Liverpool University



Riccardo Giovanetti

“PVC possesses innumerable aesthetic and technical qualities which have long made it an essential material for design and innovation”

Riccardo Giovanetti works as Design Director for several international firms. He has won several awards for his design works. He is a visiting professor at ISAD - Istituto Superiore di Architettura e Design and SCP - Scuola Politecnica di Design in Milan.



Martin Baitz

“The smartest innovations know about their product life-cycle very well”

Dr. Martin Baitz graduated in Chemical Engineering. Since 2011 he is Director Content of thinkstep AG (formerly PE INTERNATIONAL AG). He is responsible for Management, Development and Innovation of the GaBi Databases and Content.



Leanne Taylor

“The breadth, diversity and high standard of the entries clearly shows the potential of PVC to make a positive contribution in all aspects of a modern society”

Leanne Taylor is Group Editor for the plastics division of Rapid News Communications Group, a publisher of leading B2B magazines, media and events. Alongside her role as Group Editor, Leanne also holds the position of Conference Manager for Interplas.

2016 WINNERS



Alexander Hoffer, Dennis Planner, Greg Harrison, Dieter Klamann (winners); Keith Watkinson (jury member); Filipe Constant (INOVYN).

GOLD Award **CHEMSON PACIFIC Pty, Ltd**

3D-Vinyl for Advanced Industrial
3D Printing



- 3D-Vinyl: a new lower-cost, weather-resistant, durable and sustainable alternative
- Scalable 3D printing secures PVC's role in the future of Advanced Manufacturing



Martin Baitz (jury member); Arne Hautekeete (winner); José-Luis Roman (INOVYN).

SILVER Award **BEAULIEU INTERNATIONAL GROUP**

BerryAlloc® vinyl planks and tiles: quicker to install with DreamClick locking system



- DreamClick system for vinyl planks and tiles speeds installation
- Rigid in all temperatures, 50% quieter than its competitors



Keith Watkinson (jury member); Fabien Perez (winner); Luc Castin (INOVYN).

BRONZE Award **ALIAxis GROUP**

Shhhh! Quieter Chutunic branch pipe for high-rise buildings



- Quieter waste pipe for high-rise buildings, fire resistant
- Spiral grooves inside maximise water flow, single stack



Leanne Taylor (jury member); Jane Gardner (winner); Roger Mottram (INOVYN).

SUSTAINABILITY Award AXION CONSULTING

RecoMed-a “healthy” way to increase sustainable PVC recycling



- Recycles healthcare plastics for horticulture and other sectors
- VinylPlus-funded example of Europe’s circular economy



Martin Baitz (jury member); Magnus Sønsterud, Torbjörn Klaesson, Mrs Heike Gehlen (winners); Uwe Dietsch (INOVYN);

INDUSTRIAL DESIGN Award BOLON AB

Bolon By You - woven vinyl-flooring with an accent: yours



- You design it, Bolon flooring makes it, from 30% recycled materials
- Interactive tool for flooring design with 3D effects



Martin Baitz (jury member); Maja Sønderkov (winner); Carmelo Ricci (INOVYN).

SPECIAL PRIZE Award **AARHUS SCHOOL OF ARCHITECTURE**

Reuse = Waste Reduce: sustainable urban agriculture with reuse of PVC



- Incorporating recycled PVC into urban agriculture
- Intensive farming with hydroponic units from recycled PVC



Richard Blume (jury member, replacing Lena Johansson); Dirk Leiss (winner); Dirk Willaert (INOVYN).

SPECIAL PRIZE Award **BENECKE-KALI KO AG**

Dynactiv Power - energy-producing reservoir cover



- Energy-saving, energy-producing reservoir covers
- S-PVC-based foil laminated with ultra-thin solar cells

2016 NOMINEES

INNOVATION



ALIAxis GROUP

Shhhh! Quieter Chutunic branch pipe for high-rise buildings



BEAULIEU INTERNATIONAL GROUP

BerryAlloc® vinyl planks and tiles: quicker to install with DreamClick locking system



CHEMSON PACIFIC Pty, Ltd

3D-Vinyl for Advanced Industrial 3D Printing



FARAPLAN S.r.l.

Internal varnish coating for PVC pipe during extrusion



GERFLOR

Insight X'Press: new PVC loose-lay flooring made easy



INTERNORM INTERNATIONAL GmbH

Innovative insulation: uPVC window frames pressure-filled with EPS beads



KUNSTSTOFFWERK ZITTA GmbH

Coated injection-moulded parts



MOLECOR TECNOLOGÍA, S.L.

PVC-O pipes for high-pressure networks:
DN 800



RENOLIT SE

Make-over for less: Renolit Reface
renovates metal facades with PVC film

SUSTAINABILITY



AARHUS SCHOOL OF ARCHITECTURE

Reuse = Waste Reduce: sustainable urban agriculture with reuse of PVC



AXION CONSULTING

RecoMed - a “healthy” way to increase sustainable PVC recycling



BENECKE-KALIKO AG

Dynactiv Power - energy producing reservoir cover



FITT S.p.A.

Recycled Hoses Project: Recycling hose via customers and VinyLoop®

INDUSTRIAL DESIGN



BOLON AB

Bolon By You - woven vinyl-flooring with an accent: yours



INOUTIC/DECEUNINCK GmbH

Eforte Fusion: PVC window with wood interior, aluminium exterior



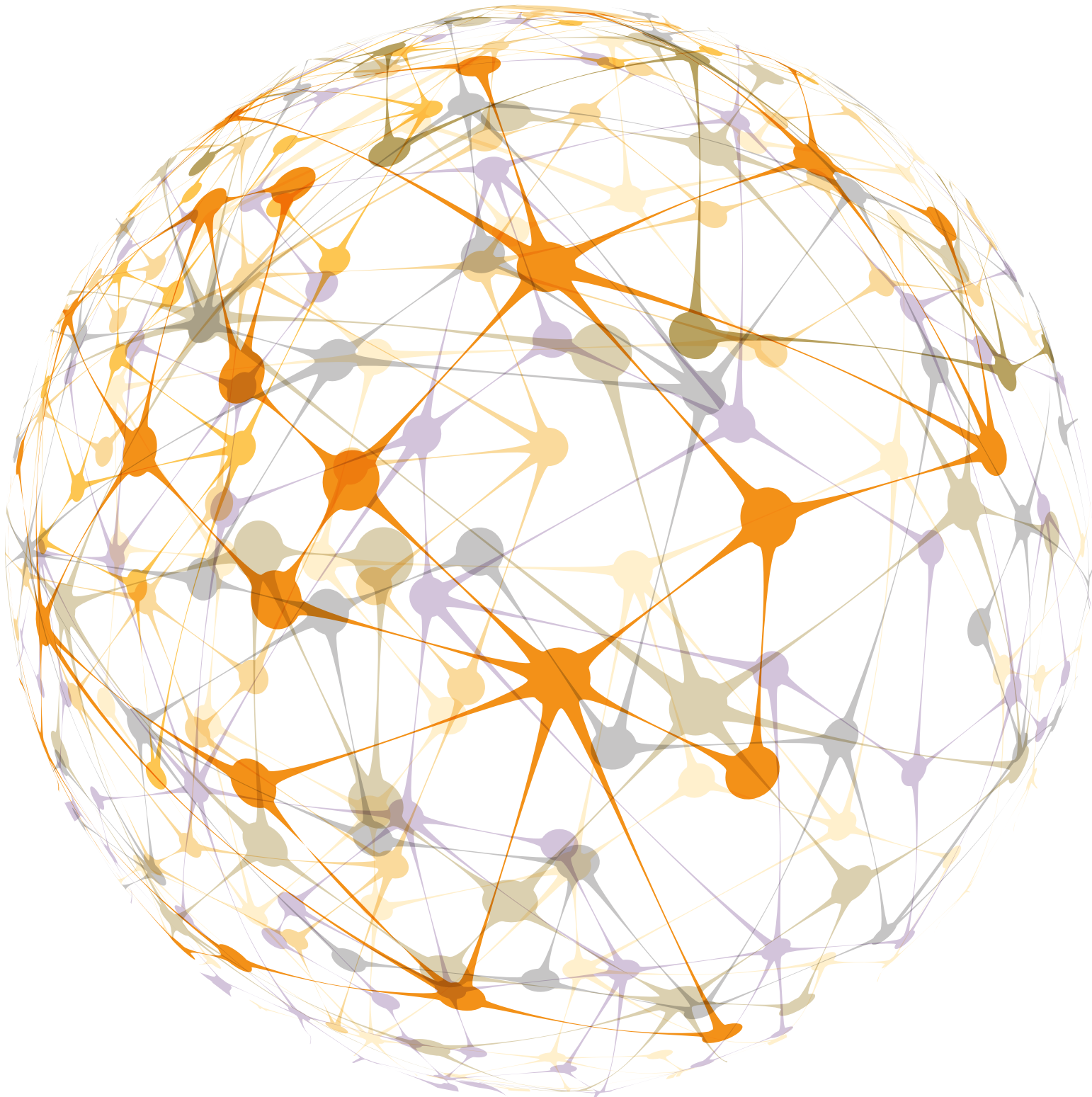
VIUDA DE RAFAEL ESTEVAN GIMÉNEZ, S.L.

PVC panel for bacteria- and fungi-free environments



ZAPET

Luminor: flexible LED lighting for designers and architects



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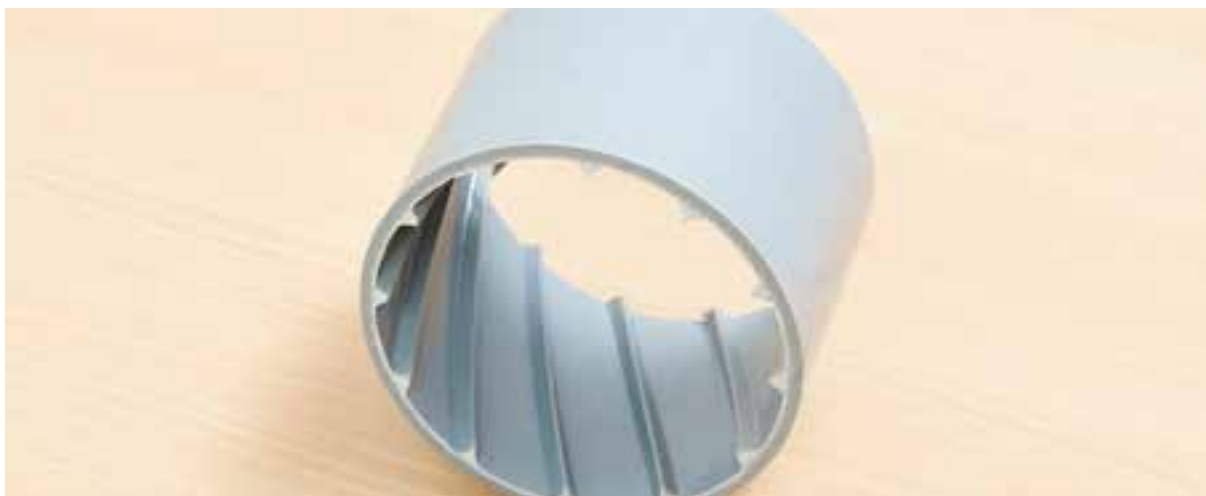


ADD-CHEM GERMANY GmbH

ADD-Chem's new range of impact modifiers for rigid PVC

Weather resistance, durability and cost are key factors in ADD-Chem's new line of impact modifiers. They expand on ADD-Chem's existing Acrylic Impact Modifiers (AIM) and Chlorinated Polyethylenes (CPE) by blending them into an alternative for extrusion and injection moulding. Applications include windows, pipe, sheet and cladding. The result: high impact resistance at low temperatures, excellent corner weld strength, high resistance to flame, and retention of colour and impact strength that resist weathering, all at lower cost.

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ALIAxis GROUP

Shhhh! Quieter Chutunic branch pipe for high-rise buildings

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Aliaxis developed the Chutunic HRB as a quieter PVC-U adaptable branch pipe element which, combined with helicoïdally profiled pipe parts, **optimises the flow of soil and waste** through single stacks for high rise buildings (HRBs). By maximising the water flow rates in soil and waste stacks, Aliaxis made it possible to discharge the waste waters of all the appliances of a high rises buildings into a single D100/110mm stack. The PVC-U characteristics of fire performance, **acoustic performance** and cold welding properties make this branch pipe element a **very useful product** for the construction industry.



ALPHACAN OMNIPLAST GmbH

Primus HL SN 12

Made to last at least 100 years, Alphacan Omniplast's high-load uPVC sewer pipe has increased ring stiffness in two colours, with high chemical, UV and weather resistance. Comparatively inexpensive and very stable, the Primus HL SN 12 pipes have a high ring stiffness while maintaining the wall thickness of an SN 8 pipe. Alphacan Omniplast achieved this by modifying the dryblend.

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AMX AUTOMATION TECHNOLOGIES GmbH

Vacuum window profile from PVC aluminium composite slashes heat transfer to near zero

Engineers at AMX Automation Technologies have developed a window profile made of extruded PVC that is up to 100% vacuum-tight, reducing heat transfer to almost zero. Applying a 35 micron aluminum foil on the inner web of the profile chamber reduces permeability 1000 times. Due to the high gloss level of the metal-surface it reduces the degree of thermal emission up to 19 times in comparison to standard PVC profiles. Final development and production will be in cooperation with an industrial partner.

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BEAULIEU INTERNATIONAL GROUP

BerryAlloc® vinyl planks and tiles: quicker to install with DreamClick locking system

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Beaulieu's new line of vinyl planks and tiles under its BerryAlloc brand features the 4-sided DreamClick system. With a lock strength of 500kg/m² (**the strongest lock on the vinyl planks market**) it allows you to **install your floor faster** than traditional click systems. You can work simultaneously with several installers on the same floor. The Rigid Composite Board (RCB) is the base, rigid in all temperatures and made without plasticisers, and is up to **50% quieter** than its competitors. Waste from the production process (trimming, sanding and profiling) is reused in the RCB mix.



BENVIC EUROPE

PVC compound with thermoplastic resins with improved abrasion properties

Developed for a customer in the furniture industry to make profiles for closets, the new PVC compound is less costly since it is blended with a thermoplastic resin that allows co-extrusion. Such a process is required by the industry to have profiles which have a soft product on a rigid one, giving it enhanced mechanical properties compared to PVC alone. The new compound demonstrates that PVC is a highly versatile material which can be mixed with other thermoplastic resins to produce compounds with a variety of mixed features.

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CHEMSON PACIFIC Pty, Ltd

3D-Vinyl for Advanced Industrial 3D Printing

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Chemson secures PVC's role in Advanced Manufacturing with 3D-Vinyl, extruded & pelletised to produce **lower cost, more fire- and weather-resistant feedstock**. As a lower-cost base polymer that's non-toxic and sustainable, PVC has an edge over its incumbent thermoplastic competitors, **opening up a whole new market segment**. And watch out for Chemson's 3D-Vinyl robot!

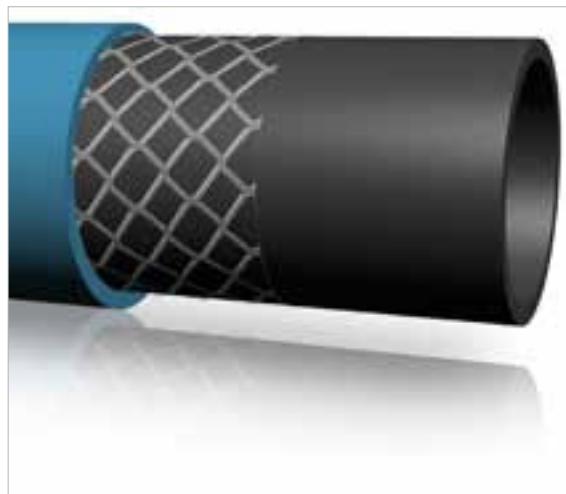


DIETZEL UNIVOLT GmbH

Anti-microbial electronic management systems control medical risks

Univolt's Antibac Technology is a complete protected line of PVC electronics conduits and cables that defend against a large number of microorganisms. They include Gram-positive and Gram-negative bacteria, yeasts, algae fungi and mold. In two years of development and testing, Antibac Technology can also be applied for private use and public surroundings.

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ESPIROFLEX s.a.

High-power, high-temp cleaning with Espiroclean hose

Espiroflex has boosted the power potential for PVC hose used to clean high-fat, high-salt surfaces in food-processing facilities, to 80 bar at 40 degrees Celsius. Light and flexible, heavy metal-free and non-toxic, it is made by extrusion of vinyl compounds and reinforced with two internal polyester thread meshes. Espiroflex is designed to clean animal fats, such as in ham salting houses and other high-corrosion environments, as well as the cleaning of machinery including car wash equipment. It can also transfer high-fat content food liquids at high pressure.

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FAINPLAST srl

PVC foam as structural element replacing wood frames in caravan industry

For caravans, a newly developed foamed PVC compound replaces the lattice wooden strip inside the sandwich panel. Replacing the wooden strips with plastic slats seems an excellent solution for many camper builders, as the PVC resists water infiltration which can in the long run cause wood to rot. Fainplast teamed up with profiles producer Komplast to create the new product, which also offers better durability and excellent flame retardant qualities compared to wood.

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NOMINEE

FARAPLAN S.r.l.

Internal varnish coating for PVC pipe during extrusion

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Instead of applying internal coatings after cooling, Faraplan has developed a process to spray powder resin during pipe extrusion at high temperatures, creating a stronger bond with the PVC. The innovation included development of a nozzle positioned in the zone ahead of the extrusion. The optimal coating can then take place during the forming of the extrusion, at 200 degrees Celsius on average, increasing the smoothness of the internal surface with a “lotus effect” and extending the life of the pipe. It allows more flexibility to change requested properties of resins, such as anti-noise, anti-odour, anti-bacterial and insulation. This could allow reduction of pipe thickness, cutting costs on raw materials.



FRIUL FILIERE Spa

HOME: prefab modular housing's last frontier

HOME is modular housing embedding cutting-edge and sustainable technology using PVC, enabled by installation without heavy machinery. It is easy, fast and economical to erect as well as healthy, maintenance-free and durable. Each house can be equipped with a solar panel to generate power for domestic use. Friul Filiere's mission is not just to sell houses but also to transfer technology and know-how to developing markets in order to enable investors and communities to produce the full range of housing components locally.

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www.ffcmaterial.com



FUNKE KUNSTSTOFFE GmbH

Animal tested, animal-friendly: Weka Invasiv trap

Meeting European regulations on animal treatment, the Weka Invasiv trap is designed for small predator species like raccoon, mink, nutria, marten, muskrat and fox. It's water-resistant, durable, lightweight, and easy to install on land or wetlands, due to the 95% use of PVC-U materials. And it's tested to ensure it's animal-friendly, with a dark area inside to calm down and relax the trapped animal.

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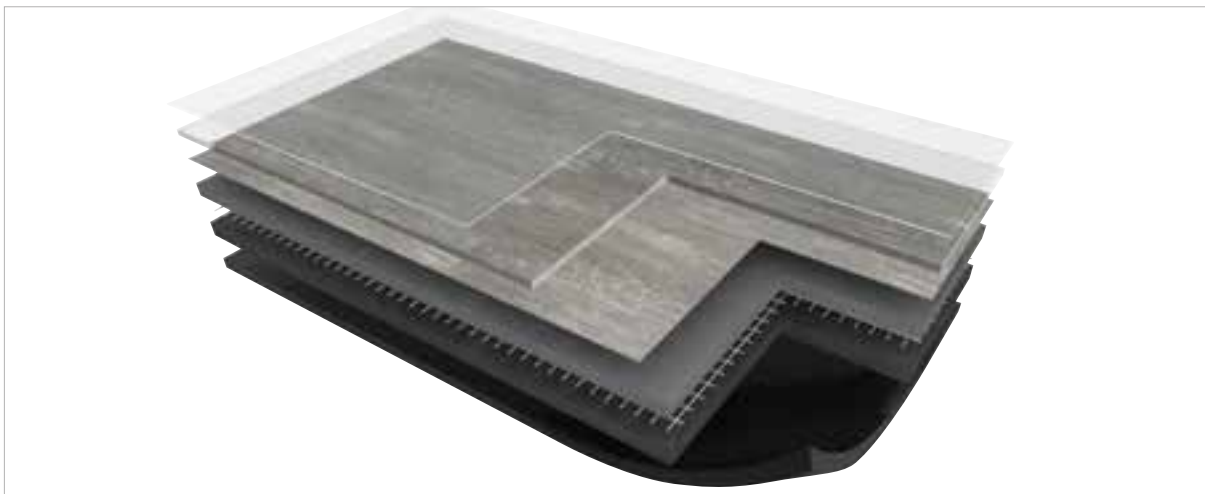


GEORG FISCHER DEKA GmbH

Dekadur Plus: modified PVC-U expands global applicability of PVC

Ten years of research and development have produced a PVC-U formulation that can be used at higher temperatures, expanding on potential applications far beyond utility and building-technology. Dekadur Plus has an unbeatable cost/performance ratio compared to premium metals, fluoro-polymers or polyolefins. Improving on energy efficiency, it is a compound that aids in providing a full system of semi-finished products or components for the use of PVC-U as a liner in dual-laminated pipes, vessels or packings.

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**NOMINEE****GERFLOR**

Insight X'Press: new PVC loose-lay flooring made easy

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www.gerflor.com

No adhesives, no cutting tools, just a pair of hands and a cutter to install X'Press flooring by Gerflor.

This multi-layer, waterproof flooring - all made with PVC and 100% recyclable - can be **laid on existing subfloor**. Gerflor has also developed innovative backing with integrated exclusive **Pressure Sensitive Adhesive**, making **installation that much easier**.



IMV TECHNOLOGIES* / CATALYSE**

SensiTemp: straw for livestock farmers that changes colour with temperature

For livestock farmers, IMV teamed up with Catalyse to develop a straw from thermochromic plastic, changing colour with temperature changes. Containing frozen semen, the straw can be thawed by soaking it in water at 37 degrees Centigrade. Blue while frozen, the straw will then change its colour to white. After defrosting the straw, it signals to the farmer the right temperature necessary to inject the semen into animals.

Mr Gorges*, Mr Schmitt* / Mr Vilaca**
+33 6 85 93 21 12**

France

www.imv-technologies.com
www.catalyse-fr.com

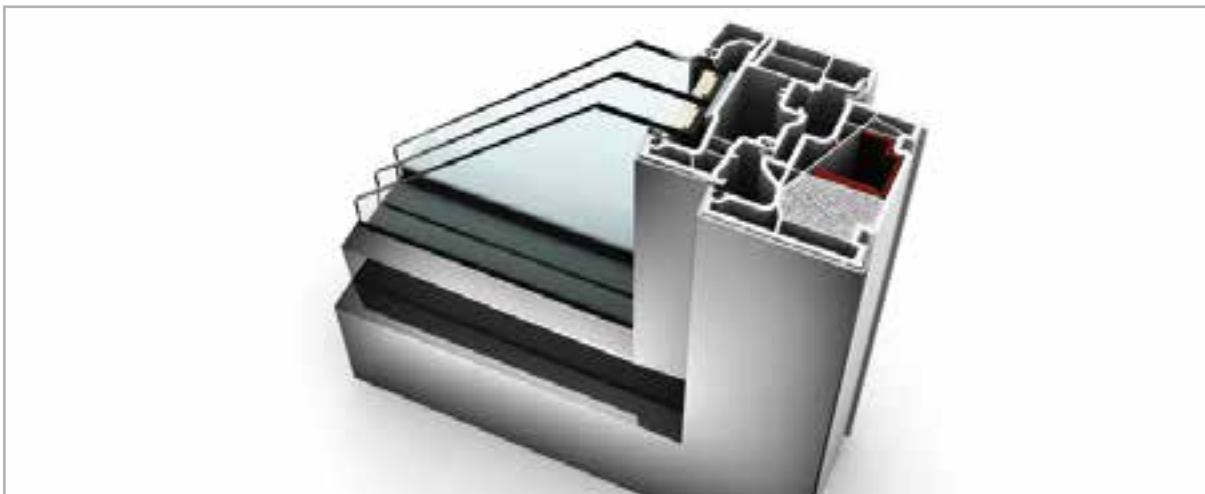


INDUSTRIAL HAND PROTECTION Ltd

Hydropellent Technology for industrial gloves

Technology developed at the Midas Innovation Center has produced HPT gloves with dual benefit – comfort as well as performance. The Hydropellent Technology coating combines PVC resins, plasticisers and other additives. The gloves feature dry grip, wet grip, winter grip, oil grip, breathability and high dexterity, while being REACH-compliant. Encapsulated air molecules provide a vibration absorption feature. And they are treated with an anti-bacterial substance for better protection.

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NOMINEE

INTERNORM INTERNATIONAL GmbH

Innovative insulation: uPVC window frames pressure-filled with EPS beads

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Internorm has significantly improved thermal insulation in PVC frame profiles by **inserting expanded polystyrene (EPS) beads** that are HCFC-, HFC- and FC-free. The pearls are blown into the frame with a specially designed filling station that **allows continuous and complete filling** - also in the corner section of the window profile. The U_f (frame) value of uPVC windows decreases from 1.1 to 0,92 W/m²K, an **improvement of frame insulation of 20%**. **Material costs** for insulation measures are **significantly reduced**, a further step towards affordable climate protection.



NOMINEE

KUNSTSTOFFWERK ZITTA GmbH

Coated injection-moulded parts

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Zitta has developed a way to **combine injection-moulded parts with the extrusion process**, creating new areas of applications. The moulded parts are fed through an extrusion die so that an extruded film connects the parts together. The combination makes it possible to produce calibrated profiles with a **precision of +/- 0,1 mm** in virtually any geometric form, with **exact dimension inside**, independently of the wall thickness. With 50 years' experience in die-making and profile manufacturing, Zitta prides itself on making custom formulas for windows or furniture within three days and die-making within 10.

**NOMINEE****MOLECOR TECNOLOGÍA, S.L.****PVC-O pipes for high-pressure networks:
DN 800**

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www.molecor.com

With its **DN 800 mm** PVC pipe withstanding pressures up to 25 bar, Molecor can now **compete with the range of ductile iron** manufacturers. DN 800, like other Molecor pipe, is corrosion-free and 100% recyclable, easier and quicker to install, and has greater hydraulic capacity and longer life. This solution **opens new applications** in the field of heavy construction projects and high performance installations, where today, PVC pipes are not common yet.



PIPELIFE NEDERLAND B.V.

Safer gas lines with Gas-Stop module for Polsafe Tee-Piece

When gas lines are damaged, usually through excavation, leaking gas can be highly dangerous. Pipelife Nederland's Gas-Stop module is inserted in a Polsafe Tee-Piece in a matter of seconds in low-pressure PVC gas piping, with minimal loss of gas. Updating Polsafe's 25-year-old system widely used in Austria and the Netherlands.

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PROFINE GmbH

Anti-microbial electronic management systems control medical risks

Profine's Mobile plastic house kit consists of recyclable lightweight PVC panels, doors and flooring, which two people can easily assemble within two days. As PVC it requires no protective painting or maintenance. Its modular construction offers a wide range of possibilities for interior and exterior design and can include electricity and heating.

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PROFINE GmbH

Wired windows: Lockstar Security Window System

Made of 40% recycled material, the Lockstar Security Window System is a new generation of window combining the widely known advantages of a PVC window with innovative technology. An integrated electronic device monitors any mechanical effect relative to the windows, including frame, glazing and fittings. The system can expand on options regarding smart home technology, wiring your home to online communications. The window system can further reduce CO₂ emissions with a product to combat greenhouse gases.

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REHAU AG + Co

Geneo Inovent: the window that breathes while it's closed

Rehau's Geneo Inovent PVC windows automatically transport humidity to the outdoors and lets in temperature-controlled, filtered air while the window is closed. This means less loss of energy because the heat is saved: up to 71% heat recovery. Other benefits from the fibre-reinforced PVC window: burglar resistance and noise reduction. They can replace other windows in one step, without additional core boring or masonry work.

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RENOLIT ONDEX

Rigid and translucent vinyl windbreaks for farm buildings

Wind tunnel-tested, Renolit Perfolux protects livestock from draughts and the sun's rays with strong, weather-resistant PVC material that still allows the needed light and air flow while reducing energy costs. With shape memory, Perfolux is highly shock resistant, thanks to the bi-stretching manufacturing process that creates a mesh in the molecular structure without the use of chemical additives. Made from 60% recycled material, Perfolux improves hygiene and comfort, contributing to higher productivity.

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NOMINEE

RENOLIT SE

Make-over for less: Renolit Reface renovates metal facades with PVC film

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www.renolit.com

Flat metal facades get a **total make-over** with Renolit Reface, a semi-rigid film consisting of several layers – PVDF, PMMA, PVC as well as an acrylic adhesive. Overall thickness with the adhesive is 160 µm. Quickly applied, it **protects the façade** against weathering and the sun's rays, and its **anti-stick component** resists dirt buildup, resulting in lower maintenance costs. It allows a **redesign that's 50% less costly** than a full renovation with new panels.

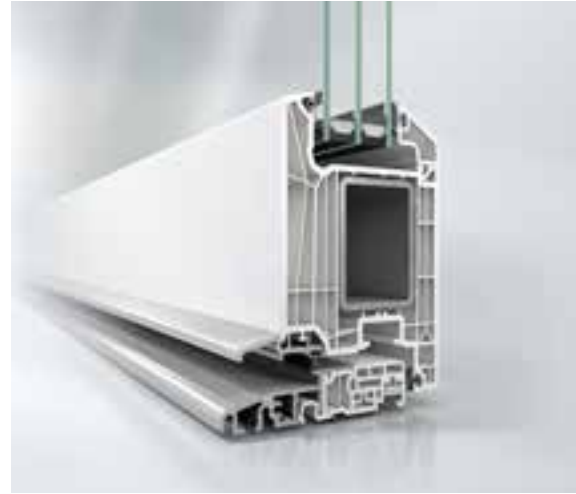


RÖCHLING ENGINEERING PLASTICS SE & Co.KG

Antibacterial, PVC-based hybrid material for medical use

Operating theatres and other hygienic risk areas need antibacterial, fire-resistant material to ensure the safety of the patient and medical staff alike. TroBloc®M-F30 is Roechlin's newly developed PVC sheeting, treated with a special surface, combining the well-known properties of vinyl with new characteristics not found in other products. TroBloc®M-F30 helps prevent health risks in medical areas, reactive against staph infection such as MRSA.

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SCHÜCO POLYMER TECHNOLOGIES KG

Schüco Living offers greater choices for windows and doors

Schueco's new PVC-U window and door system called Schüco Living presents the first weld-on EPDM gasket. Using elastic, weld-on material increases the sealing effect in the difficult corner area of the unit, whilst also allowing for a closed, visually appealing corner design without hard gasket corners. The basis is high quality, environmentally friendly, stabilised PVC-U, highly resistant to light, weathering and impacts and extremely resistant to deformation even at higher temperatures. As a result, follow-up costs for servicing Schüco Living are reduced to a minimum. It is also fully recyclable.

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SP TECHNICAL RESEARCH INSTITUTE OF SWEDEN

Overcoming barriers with barriers: Nanoclays designed for plasticized PVC

Using nanoclays - nanoparticles of layered mineral silicates - SP Technical Research Institute of Sweden is developing a plasticised PVC with improved mechanical and barrier properties and improved flame retardant qualities. In a process known as exfoliation, nanoclays can create physical barriers for gases and organic molecules. They will also promote the formation of a char layer when exposed to fire. Nanocomposites have almost unlimited potential as future supermaterials.

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VINK-ELST B.V.

Hoofcare vinyl spray mat for disinfecting and medicating cows' hooves

Cows' hooves are constantly in contact with liquid and organic manure which causes contagious hoof diseases. The vinyl mat is fluid-filled and covered with spheres. If the cow walks over the mat and steps on or near a sphere, a valve will open and medication or a disinfecting agent will be sprayed onto the hooves. The Hoof care spray mat consists of three parts: bottom mat, spray mat and cover mat, which requires no maintenance. With other existing footbaths, when cows pass through them the liquid with which they are filled is contaminated with manure and so the treatment loses its effectiveness.

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VPW NINK SANGERHAUSEN

Corrugated PVC sheets with an attractive metallic look

VPW Nink now has a second generation of its Salux corrugated PVC, applying the metallic trend to its standard PVC colours. The result: not only a “cooler” aluminum effect but also cooler in temperature, as the metallic particles better-reflect infrared radiation. The aluminic sheets can be up to 15 degrees cooler than the standard grey layer, and the UV protective additives in the decorative layer ensure long-term durability. It's more sustainable too: the lower side of the corrugated sheets contain up to 25% regrain from pre-consumer waste and 25% of its own grounded material.

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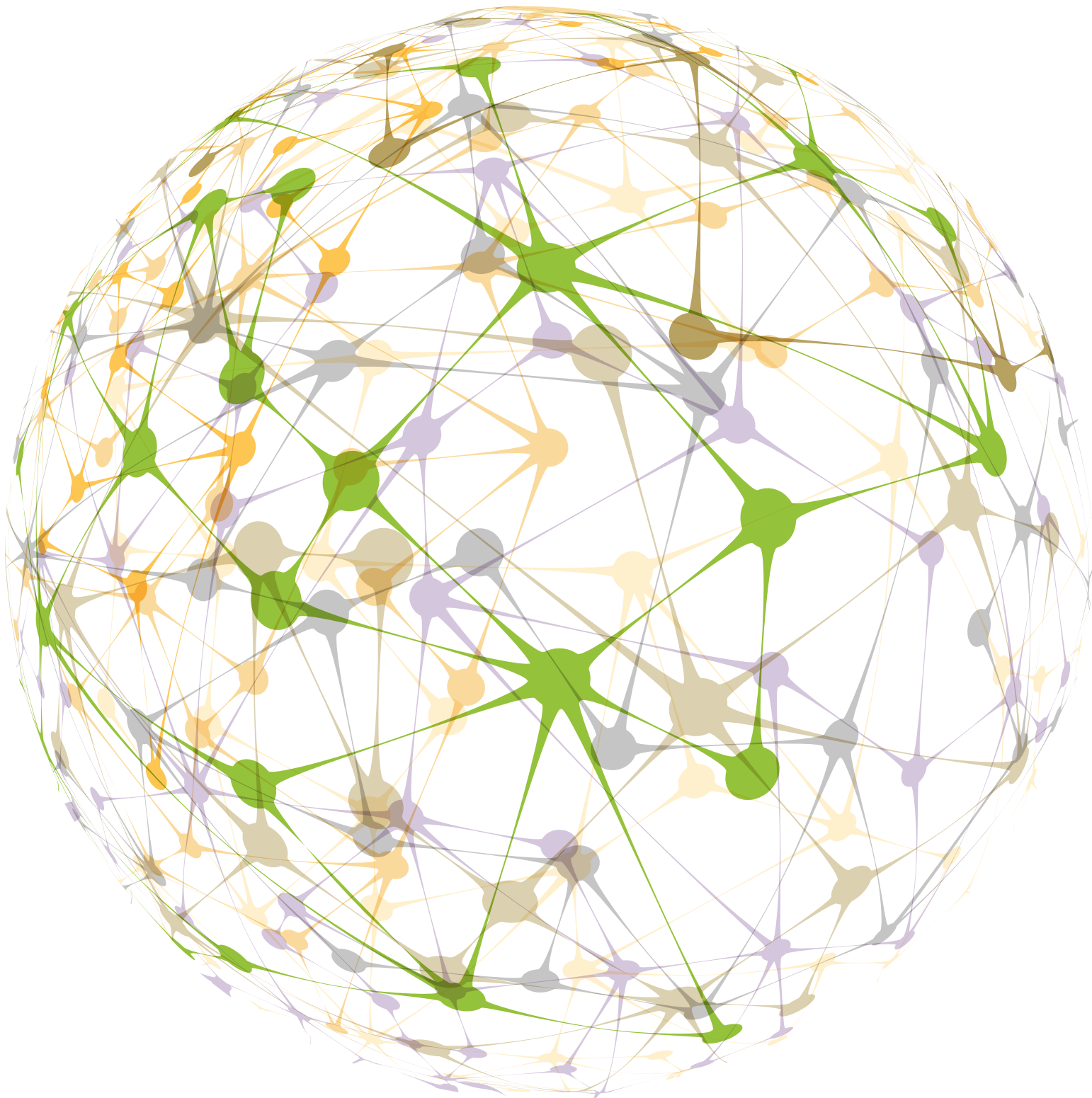


WESTFÄLISCHE KUNSTSTOFF TECHNIK

Pipe for well-digging enlarges and protects

Designed for digging wells, ribbing is added to enlarge the surface of the pipe. It also protects against damage from gravel. Westfaelische Kunststoff Technik, with more than 50 years of experience in made-to-order pipe production, developed and tested a special tool for extruding the pipe with ribbing. Much lighter than concrete, PVC ribbed pipe can be more quickly and easily installed. When digging a well, that can make a major difference in the cost of a project.

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AARHUS SCHOOL OF ARCHITECTURE

**Reuse = Waste Reduce: sustainable urban
agriculture with reuse of PVC.**

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The project by the Aarhus School of Architecture increases the lifespan of such typical PVC applications as pipes, gutters, cables, roofing sheets prior to recycling by incorporating them in urban agriculture.

The sorted PVC waste materials are turned into Growing Hydroponic Units producing food as an intensive farm, using collected rainwater and electricity produced by PV-cells powering LED grow lights. Examples include those in Cuba, India, Japan, UK, USA and Denmark.



ACTIPLAST

Biobased PVC compounds - A sustainable future for the vinyls industry

Actiplast is developing PVC formulations with bio-based ingredients which meet clients' requirements, such as for injection and extrusion moulders. Actiplast sees a future where bio-based PVC will become the standard formulation, improving the image of the vinyl industry. One advantage: you don't need coupling agents for natural fillers in PVC unlike polyolefins. One challenge: producers of vegetal fillers such as wood, hemp and flax fibers, have limited understanding of the plastics industry. Another challenge: reducing production costs.

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ALPHACAN OMNIPLAST GmbH

GreenTube SN 10 pipes: hazard-free, fully recyclable

For projects requiring pipes made from non-hazardous materials and with a smaller environmental footprint, Alphacan Omniplast has developed GreenTube SN 10. The coextruded foam core pipe is lightweight yet with high stiffness, resistant to chemicals, UV and weather, and is fully recyclable. Colouring is done without heavy metals and the manufacturing saves 50% in oil.

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ATECO srl

New life with regenerated PVC from plastic cable

Milled PVC from the cold crushing of electrical cables is washed and delivered to VinyLoop® for re-granulation, to offer regenerated PVC granules to the market in compliance with EU regulations. Both the metallic electric conductor of energy and PVC wrapping are sorted and become new raw materials. The project accelerates the trend toward a green and circular economy while respecting both environmental and human health standards.

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AXION CONSULTING

RecoMed - a “healthy” way to increase sustainable PVC recycling

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Pioneered by anaesthesia professionals, RecoMed is a **PVC take-back scheme** in the UK that **recycles plastic used in healthcare**. An example for Europe's circular economy, it is run by project partners Axion Consulting, a resource recovery specialist and the British Plastics Federation, and funded by VinylPlus. RecoMed recycling bins are provided free of charge, along with educational posters, stickers, training sessions and communication materials. Granulated plastic from the recycled materials is used in making 100% recycled products for the horticultural industry for example, such as tree ties.



BENECKE-KALIKO AG

**Dynactiv Power – energy-producing
reservoir cover**

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www.benecke-kaliko.com



Dynactiv Power provides **an ultra-durable surface** cover for water reservoirs **to prevent evaporation**, combined with **solar energy-generating technology**. An ultra-durable S-PVC-based foil is laminated with flexible thin film photovoltaic cells of CIGS type. The Dynactiv water cover is installed on cut and fill and embankment reservoirs, with overall capital costs compared to concrete reservoirs up to 70% less. That makes Benecke-Kaliko's Dynactiv Power a player in the megatrend "Environmental Sustainability."



CARBOTOPIA

Recycling vinyl with Carbotopia, saving energy to do it

Carbotopia recycles vinyl, producing energy-rich gases and synthesizes methane by recirculating hydrogen to physically capture as much carbon from the feedstock as possible, using thermo-catalytic methane. To work, Carbotopia requires a cooperation by all stakeholders throughout the value chain, including waste owners over carbide-based acetylene refiners of neat vinyl resins, to peer B2B manufacturers and retailers adopting carbon recycling throughout their supply chains. The result, savings of 2 barrels of oil per tonne of vinyl.

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COLOURTONE MASTERBATCH Ltd

Colouring vinyl compounds now for automated recycling later

Colourtone Masterbatch overcame a key obstacle to the automated sorting of plastics for recycling. Near Infra-Red (NIR) spectroscopy and optical scanning in the visual wavelengths have sped up the process. A major limitation was the recognition of black and other coloured plastics that absorb infrared light. With Vynacol, Colourtone Masterbatch incorporates non-infrared absorbing pigments into the prime polymer to enable automatic sorting. Proposed reclassification of “recyclable” to materials to those that can be automatically sorted is encouraging companies to consider “end of life” as part of the design criteria.

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DIAB

Recycling scraps from manufacturing into foam panels for construction

Diab minimises its own waste disposal by processing and reusing the scraps and dust left from manufacturing its polymeric rigid foams. The leftovers are ground and mixed with glue, then pressed into low-end core that can be used in construction. While Diab makes cores for wind turbine blades and lighter trains and boats for more-sustainable energy and transport, it wants to avoid creating waste during its manufacturing. The reprocessing shows nothing must necessarily go to the landfill.

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ENCOMPASS SIGN SYSTEMS

E-waste recycled: ECO-press interior signs

Encompass creates interior signs from 100% post-consumer recycled e-waste. Using pulverised plastics that were originally keyboards, printers, cell phone casings and monitor shells, the production team employs a compression molding process to press the plastic pieces into a solid, single sheet. They're pressed into a heat-resistant mold that has been milled in a negative position that features the individual letters, characters, braille and often the logo required for the sign, later decorated with paint and vinyl.

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NOMINEE

FITT S.p.A.

Recycled Hoses Project: Recycling hose via customers and Vinyloop

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A new garden hose with a low environmental footprint, consisting of a three-layer hose made from recycled and virgin PVC. **The inner layer is made from recycled material** collected from customers and processed by Vinyloop®, a middle layer of polyester thread maintains pressure resistance and the outer layer is made from virgin PVC with high resistance to chemicals and abrasion and is visually appealing. Customers are given a discount on the hose **if they return their old hose for recycling**. A Life Cycle Analysis (LCA) shows the Fitt garden hose saves 30% in energy, 30% in CO₂ and 50% in water.

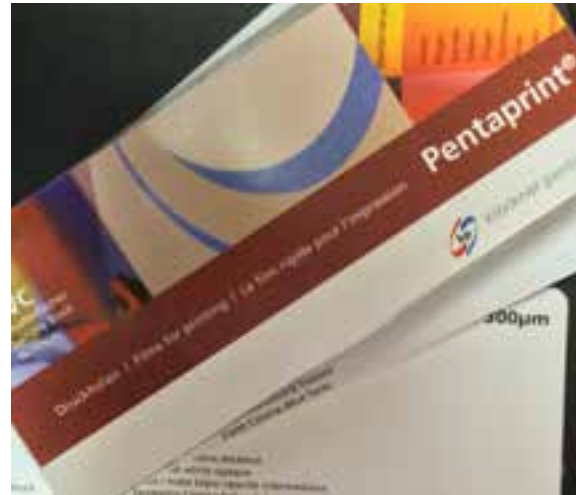


GERFLOR MIPOLAM GmbH

Symbioz PVC flooring from 100% bio-based plasticiser

Gerflor substitutes a classic crude oil-based plasticiser product with a raw material made from vegetable waste and plant oils to produce PVC flooring for sustainable construction. All production waste can be used completely for the next production cycle. Symbioz has also a new patented surface protection that reduces the consumption of water and cleaning agents during the cleaning process. VOC emissions of the product are very low.

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KLÖCKNER PENTAPLAST EUROPE GMBH & Co KG

Greener film with recycled PVC, natural filler and wood flour

KP Films, one of the largest PVC film producers, is developing a new product with a low carbon footprint. KP successfully combined 30% recycled PVC, 20% natural filler and 10% wood flour in an initial development phase. It will test various solutions with different colors, surfaces and laminations, then present the results in customer meetings and innovation workshops.

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NEXOLEUM BIODERIVADOS S.A.

Nexoleum: Biobased versatile plasticisers

Nexoleum has a novel line of plasticisers based on renewable sources, which presents similar performance to traditional plasticisers and with competitive cost. The chemical processing setup allows modification of molecular composition to cover a wide range of applications. As global warming awareness and regulatory pressure on phthalates grow, this project offers a non-phthalate plasticiser portfolio that contributes to reducing greenhouse effect gases, while providing a cost competitive alternative.

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PIPELIFE INTERNATIONAL

Pipelife's Environmental App: the EPD Calculator

The app produces an Environmental Product Declaration (EPD) based on a life-cycle assessment (LCA) that enables the user to determine the environmental impact of a pipe system and compare outcomes with alternative products. It highlights the environmental advantages, including fewer CO₂ emissions, that PVC pipe systems have compared to traditional materials. The EPD calculator resulted from a study by the Flemish Institute for Technological Research (VITO), commissioned by Pipelife as a member of The European Plastic Pipes and Fittings Association (TEPPFA). The Denkstatt sustainability consultancy in Austria validated the findings.

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REPLAST PRODUKT, spol. s.r.o.

Double-sided, heavy duty floor boards from 100% recycled PVC cables

Replast developed a greener and more-competitive industrial floor boards entirely from recycled PVC cables. Thanks to the used material it has great physical and chemical properties including excellent heat insulation, a non-slip surface, chemical stability and fire resistance. The two surface designs enable reversible utilization. The load capacity is 3.5 tonnes per dm². It is used in warehouses, workshops and production halls, indoor exhibition areas, horse and cattle stables or to protect stadium surfaces during concerts.

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RESYSTA INTERNATIONAL GmbH

Alternative to wood, with natural fiber-PVC composite using waste products

Extrudable and long-lasting, requiring low maintenance and 100 % recyclable, the Active Resysta Filler (ARF) has the noble look and feel of wood. The product of 15 years of research and development, Resysta combines ground rice husks with PVC to create a weather- and water-resistant wood-like material used in outdoor construction worldwide that does not splinter or rot over time. A replacement for wood polymer composites (WPC), Resysta is easy to shred and pulverise for the recycling process and can be introduced into production without an intermediate step.

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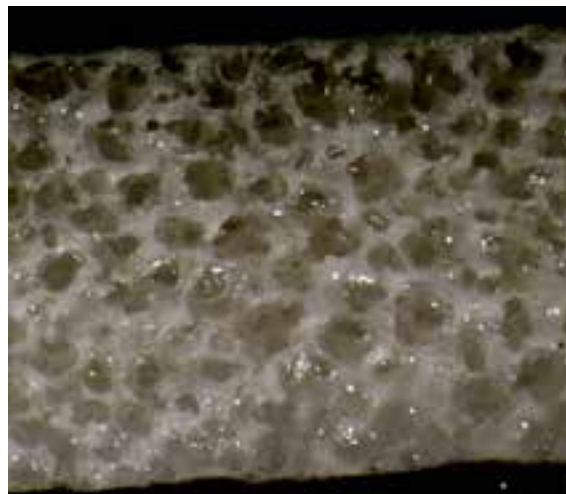


ROSSI STAMP S.r.l.

Thinframe: High thermal insulating window frames for energy efficient buildings

Rossi Stamp's Thinframe windows include foam material, processed in-line during extrusion is injected into the cavities. That results in lower heat loss (U-value of the frame lower than $0.7 \text{ W/m}^2\text{K}$), and improved energy efficiency of buildings (energy savings and CO_2 emissions at European levels), all translating into lower costs. The PVC profiles are additionally reinforced with localised glass-fibre reinforcement to give the desired strength properties in order to eliminate metals and in turn, the risk of corrosion.

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SOLVAY CARBONATE FRANCE

Towards safer foam formulations with a new bicarbonate derivative

The result of a "technopush" project in 2015, Solvay Bicarbonate France determined broad interest in a substitute for azodicarboamide (ADCA), a blowing agent in plastics increasingly restricted by regulation. Solvay developed a solution based on a specific derived sodium bicarbonate, a leavening agent in food applications, acting as a safe and efficient endothermic blowing agent. Pursuing sustainable chemistry, Solvay is developing a range of chemical blowing agents based on sodium bicarbonate formulations for the PVC market.

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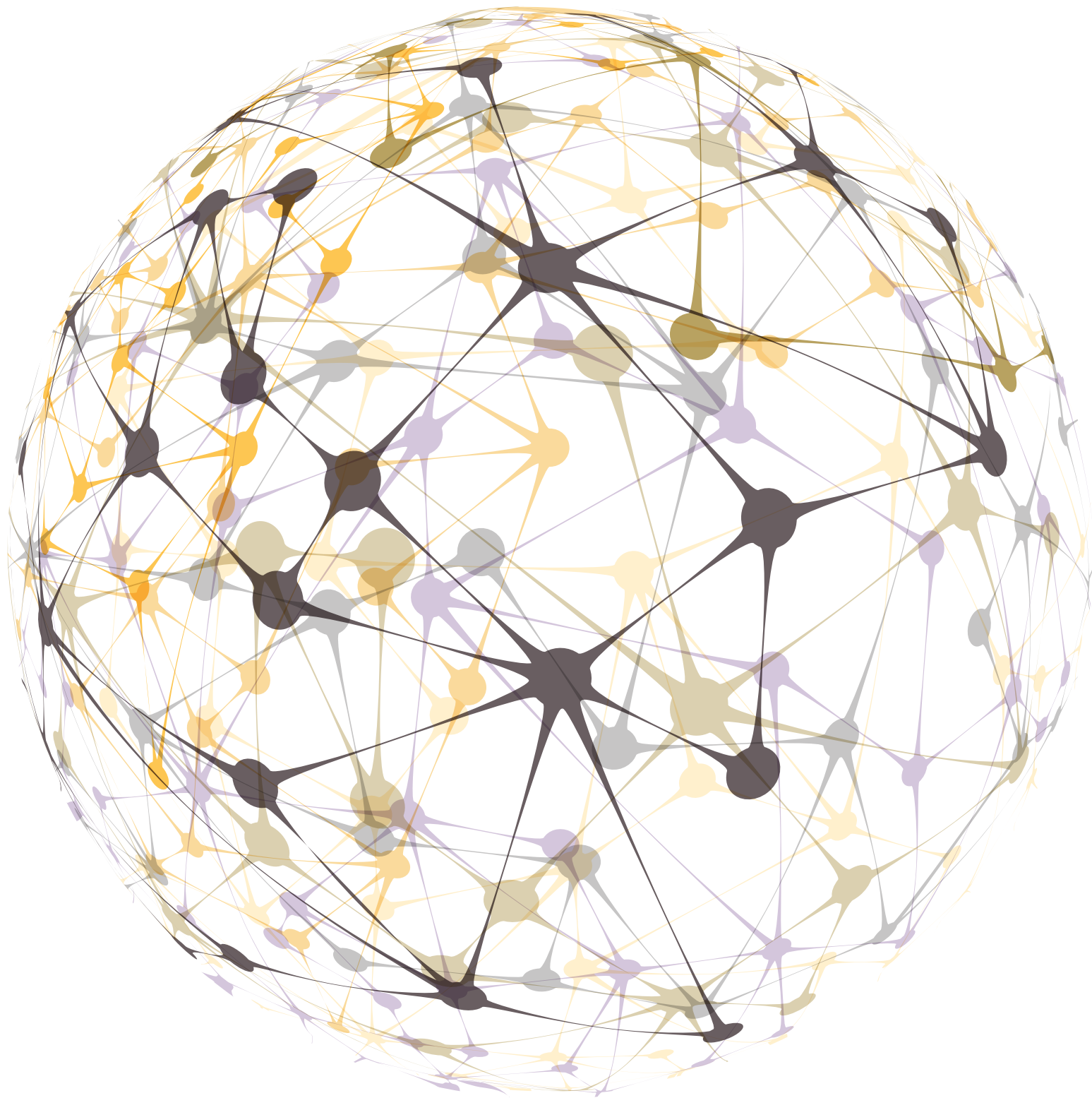


WAVIN

Wavin Recycore and International Green Deal initiative

With its Recycore Technology putting 50% recycled content in its new multi-layer, solid-core pipes, Wavin demonstrates its commitment to a greener, circular economy. The products include 110 and 160mm drain and soil pipe in a range of colours. The products will be available within Wavin's OSMA, Hepworth and Certus brands. Also underscoring its commitment, Wavin was among companies which this year signed the International Green Deal on the North Sea Resources Roundabout (NSSR).

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ALUPLAST GmbH

Ultra-slim window design with energeto® 5000 view

With the frame overlap completely concealed behind the sash, Aluplast's energeto® 5000 view follows the core principle "Less is more" of modern architecture, and a trend toward finely-structured facades. The exterior visible width of only 109mm also satisfies the desire for more natural light and higher solar gains. It also stands out in energy efficiency: with a U_f value of 1,0 W/m²K, the window reaches U_w values suitable for passive houses. The system can also be used in renovation projects, compatible with the renovation frame.

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BOLON AB

Bolon By You - woven vinyl flooring with an accent: yours

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With its own **on-site recycling plant**, Bolon weaves its six **custom vinyl floorings in 16 colours, with 30% recycled materials**. To support the collection, **a newly developed web tool allows for playful design experimentation**, enabling users to realise architectural possibilities. Intuitive and simple to navigate, the interactive tool easily guides users through a series of steps leading them to their own flooring design, with three-dimensional effects. Thus the name: Bolon by You.



**CEZAR PRZEDSIĘBIORSTWO
PRODUKCYJNE
DARIUSZ BOGDAN NIEWIŃSKI
Premium skirting board for flooring**

The Premium skirting board by Cezar is a perfect finish for three-layer plank floors, laminates and other hard-cover floors. The 22mm width ideally masks dilation gaps. It comes in 112 available colours, has invisible connecting accessories, sound muffling, a channel for masking cables and wires along floors, a complete system of accessories, multi-layer protection, and flexible edges. An additional advantage is the possibility of applying a transparent strip with an LED strip, which gives an amazing afterglow effect.

Bartłomiej Sochon
Poland
www.cezar.eu



DINCEL CONSTRUCTION SYSTEM

**Waterproof, quake-proof, 100-year
durability: Dincel Construction System**

When filled with concrete, Dincel's PVC polymer forms provide an economic, strong and durable structure for lift and stair shafts, protection against clay or soil failure in basement excavations. So strong it can provide the core construction of a high-rise buildings up to 50 storeys, last up to 100 years and withstand a magnitude 9 earthquake. Sections snap together easily with a unique "claw" design that creates a tight, waterproof wall panel when filled with cement.

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ESSENTRA EXTRUSION B.V.

PVC Curbs for Skylux combine different materials and insulate

Essentra developed Skylux as a way to combine bitumen and rubber roofs with PVCu and other plastics. Thanks to multi-cavity tooling developed by Essentra, a multi-profile clip connection allows a maximum of energy savings. The polyester curbs insulate and are very solid thanks to their glass fibre reinforcement, an example of how PVC can innovate and adapt with different materials to add value as well as save energy for the customer.

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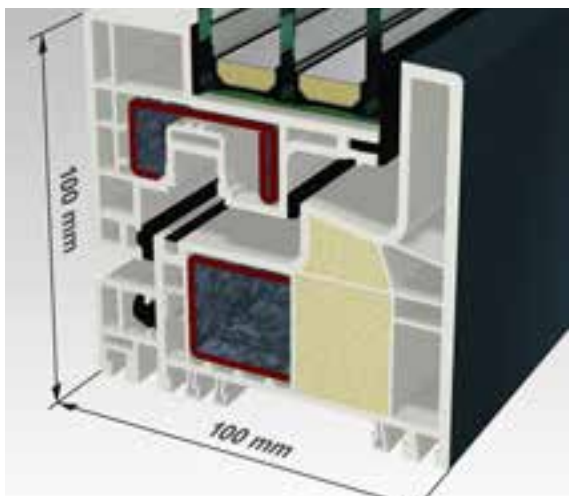


FUNKE KUNSTSTOFFE GmbH

Funke Pheasant Feeder keeps feed safe, dry and PVC-durable

In the wild, up to 30% of feedstuff can be lost to marauding mice, rats, crows, doves and other animals. Not so with the Funke Pheasant Feeder. Made mainly from PVC-U, it is made to be exposed to all weather while remaining solid and safe. A special dosing element can be adjusted for various sizes of grain including maize, wheat and sunflower seeds.

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GEALAN FENSTER-SYSTEME GmbH

Gealan-Kubus plastic window and balcony door system

With a minimal, symmetric profile, the Gealan-Kubus door system allows the largest possible glass area for PVC window and balcony doors. Innovations include better static equilibrium thanks to glass bonding using STV adhesive technology, and better thermal insulation thanks to IKD foam technology. In addition, the high-quality acrylcolor surface is a co-extruded, coloured top layer made from high-strength PMMA acrylate. By using PVC, Gealan-Kubus combines high thermal insulation, durability and sustainability - an attractive alternative to wood and aluminium for use in high-end and architecturally sophisticated buildings.

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GRANZPLAST S.A.

New water-resistant profile design for door applications

Granzplast has developed a new profile design to substitute wood with PVC. The main objective: to eliminate the risk of damage from water or humidity in warm climates, of which the Spanish-based Granzplast knows well. A producer of custom PVC compounds in rigid, flexible and black masterbatch, the company innovates its offerings via European research projects including CDTI (Centre for Industrial Technological Development) and AIMPLAS (Technological Institute of Plastics).

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**NOMINEE****INOUTIC / DECEUNINCK GmbH**

Eforte Fusion: PVC window with wood interior, aluminium exterior

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www.inoutic.com

Inoutic developed a window that's a fusion of a **PVC core, timeless wood on the inside** and high-quality **aluminium design on the outside**. Eforte Fusion is more **cost-effective** than a wood-aluminium window due to the high cost of aluminium cappings for wood, making PVC even more attractive for architects and planners. Another advantage: the **wood cappings can be applied later**, allowing maximum protection during the construction phase, and the wood can later be matched with the furnishing style.



MARLEY DEUTSCHLAND GmbH

New plastic rain gutter system in trendy “anthracite metallic” colour

Marley turns rain gutters into an architectural fashion statement with PVC in “anthracite metallic.” One challenge was to find the right blend of PVC that would result in the desired metallic appearance while ensuring the needed UV stability. Marley is developing other applications of the metallic look, such as grills for ventilation products, aimed at fitting into modern architecture.

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POLITECNICO DI MILANO

Textile-Wall: for DIY repair and building by disaster-affected communities

For disaster-hit areas, Textile-Wall is a foldable cell panel made of semi-rigid PVC bars and covering layers in textiles, which can be filled with a stabilizing or insulating material. Its dual use as first repair and for reconstruction follows a recent trend in emergency aid to stimulate self-repair. Textile-Wall is a socially responsible design, low-cost, ecologically reliable, replicable at large scale and adaptable everywhere. It may contribute to improving the lives of many displaced persons and foreign refugees.

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POLYMER-CHEMIE GmbH

Sustainable foam solution from PVC and natural fibre for indoor and outdoor applications

With a composite of S-PVC and rice husks, Polymer-Chemie succeeds in creating a foam sheet that's a sustainable alternative for indoor and outdoor applications like sidings, deckings, furniture and booth construction. The main challenge was to develop a foam compound including 40% natural fibre and produce a material 18mm thick and 1,50 meters wide. It's also 100% water-resistant, UV-resistant and 100% recyclable.

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SATTLER PRO-TEX GmbH

Polyplan Candy - Bring color to your halls and tents

Polyplan Candy features colourful highlights with its halls and tents. With these new membranes it is also possible to make stunning light effects. It is manufactured via a coating process of soft PVC on polyester fabric that produces a highly translucent, coloured membrane. The fivefold increase in translucence requires less artificial light, saving energy.

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TIPTON GLOBAL

Vinyl record recycling project - Vinylize

Vinylize recycles tonnes of vinyl records into eyewear and other products including eyeglass cases, display stands, mirrors and business cards. With celebrities wearing some of the products (including Elton John, Sir Richard Branson and Robbie Williams) Vinylize convinced potential customers that they are durable, fashionable and sustainable.

The recycled records come from library collections, unsold records from distributors and defective pressings from record manufacturing plants, as well as private collections.

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URBANATURE

Urbanature's Hanging Garden - lets you green your walls

Containing ornamental or edible plants, the vinyl tubes are suspended between two steel cables on a wall, easily adjustable and removable. They can be extended horizontally or vertically. Based on hydroponic gardening, they require less watering, with marginal evaporation. Suitable for indoor, conservatories and sun-protected outdoor spaces. Most popular product at the Designer Open 2014 in Leipzig.

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VISSER & MEIJWAARD

Indoor, outdoor furniture – and coffins – from industrial PVC cloth in Truecolors

With Truecolors, Visser & Meijwaard take a different approach to designing a wide range of products – from benches, stools and cabinets, to camping closets, gymnastics bucks and coffins – with PVC cloth in bright colours. A Truecolors coffin can be a colourful alternative for a final farewell – adorned with bright cloth and zippers to open and close it. The concept: upgrading the PVC from a technical industrial cloth to an esthetic and fresh design element.

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VIUDA DE RAFAEL ESTEVAN GIMÉNEZ, S.L.

Brisa: traditional Alicante-type external blinds from foam PVC and vegetal fibre

With the look and feel of Soria pinewood, La Viuda has created profiles for external blinds by combining foam PVC and wood vegetal fibres. Through extrusion, Brisa matches the properties and appearance of high-quality traditional Alicante-type wood blinds with a solid profile. The new formulation uses PVC and a chemical foaming process with stabilisers and pigments for outdoor applications. Among the advantages compared to wood: no need to treat it against moisture, bacteria or fungi, no edging and surface sanding, no need to paint and no maintenance required.

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NOMINEE

VIUDA DE RAFAEL ESTEVAN GIMÉNEZ, S.L.

**PVC panel for bacteria- and fungi-free
environments**

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Spain
www.laviuda.es

La Viuda's Paradec S-500 is a **PVC panel** of 500mm, for ceilings or walls **with high health and hygiene requirements**. It has an innovative, **silicone-free seal** that creates an **airtight joint between profiles**, suitable for use in hospitals and food processing. The panel profile is made by **combining three PVC materials - rigid, flexible and foamed**. La Viuda adjusted the extrusion process to create the right contact zone between profiles in order to obtain a complete airtight bond, avoiding plate-out in the calibrator. It is the only profile of its kind on the market, measuring 500mm wide.



VULCAFLEX S.p.a.

Brightlast: backlit synthetic leather - the shine through vinyl

This multilayer plasticised PVC (pPVC) synthetic leather could be applied on LED lights so that when lit, light passes through the material and is emitted from the surface. Still in development, it can be used in a number of different fields: advertising and marketing materials, home and naval furnishing, interior decoration and design, and technical clothing.

Brightlast has the potential to be a new tool in the hand of advertisers, designers, architects and artists.

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NOMINEE

ZAPET

Luminor: flexible LED lighting for designers and architects

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www.zapet.it

A lighting system made with a 100% PVC extruded profile featuring **various levels of transparency**, allowing better diffusion. Luminor, the first of this class in PVC, also has UV light resistance features. Zapet identified the right stabilizer to keep the right level of transparency and at the same time avoid yellowing of the product. It also determined the proper thickness of the profile to **maximise light diffusion and avoid the “Christmas tree” effect**.

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