

A wide-angle photograph of a modern hospital hallway. The floor is covered in a dark wood-grain vinyl material. On the right, a long wall of floor-to-ceiling windows provides a view of an outdoor area with trees and a parking lot. In the center, a wide staircase with light-colored steps leads upwards. Two people are walking up the stairs. On the left, there are large white cylindrical columns and a blurred figure of a person in the foreground.

VINYL IN HOSPITALS

FLOORING, CEILING AND WALL COVERING

CONTENT



PVC Med is an alliance of the PVC medical industry value chain represented by PVC resin & plasticiser producers and PVC converters to proactively engage in PVC and healthcare related debates. More info on the PVC Med Alliance can be found on www.pvcmed.org



VinylPlus is the new ten-year Voluntary Commitment of the European PVC industry which builds upon the achievements of the Vinyl 2010 programme, taking the next important steps in tackling the sustainability challenges for PVC and also in establishing a long-term framework for the on-going sustainable development of the PVC value chain. More info on the program: www.vinylplus.eu

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Architecture seeks to ensure that patients, relatives and employees in the hospitals of the future receive the best possible treatment and optimal working conditions. Healing architecture is a key word in projects to build new hospitals. The concept covers light ingress, colour, art, access, navigation around the hospital, noise reduction, music and green recreational surroundings. According to scientists, there is no doubt that all of these elements exert a positive influence on the success of any course of treatment and help to improve hospital's working environment. In addition to hospitals, vinyl is used in all corners of the healthcare sector, for example, in laboratories, and medical and dental clinics.

A MATCH MADE IN HEAVEN

Hospitals and vinyl are a match made in Heaven. Vinyl allows the architects free rein because there are almost infinite options to design with vinyl. Vinyl can be combined in innumerable ways. The material is flexible to the extent that it is possible to combine aesthetics and functionality, for example, in connection with new requirements to make it easier for patients and relatives to find their way around the new hospitals. It will also be possible to differentiate between the different zones within a hospital and to integrate art into flooring and wall covering.

VINYL IN HOSPITALS

Vinyl is also an excellent choice of material for laboratories and wet rooms. It is highly functional and has excellent hygienic properties. From the overall financial perspective, vinyl is also an excellent choice as it is durable and easy to clean and maintain.

VINYLPLUS AND SUSTAINABILITY

With regard to sustainability, many improvements have been made in recent decades. VinylPlus, the PVC industry's comprehensive environmental programme, is a specific example. This booklet describes some of the results of this programme and why vinyl was used at the London Olympic Games, which aimed to be the greenest event in the history of the Olympics. We describe how, thanks to innovative thinking, the flooring industry has successfully developed vinyl flooring without classified phthalates.

We also describe how financial analyses have shown that vinyl flooring is an excellent choice, taking into account all the

costs connected to flooring from the time of purchase through use and up until ultimate disposal at the end of its useful lifetime.

I hope that this booklet will open the eyes of architects, designers and engineers alike to the myriad of potential uses of vinyl in connection with the huge investments being made in new hospitals.



*Dr. Brigitte Dero
General Manager ECVM (The European
Council of Vinyl Manufacturers)
General Manager VinylPlus
Spokesperson PVCMed Alliance
Brussels, 2014*

Vinyl is the name commonly used to describe polyvinyl chloride (PVC). Vinyl is an extremely flexible synthetic material, the main components of which are salt, oil, plasticisers, stabilisers and pigments. It is the second most commonly used plastic material, with annual global production of 40 million tonnes. Vinyl has a part in all of our lives. At home, for example where tap

water is usually transported in pressurised pipes made of vinyl. After it has been used and polluted, water is led away from houses in drain pipes made of vinyl. When it rains, water is collected and drained via vinyl gutters and drain pipes. Your house may even have vinyl window and door frames. In a hospital, just under half of all the medical devices used are made of vinyl.

WHAT IS VINYL?

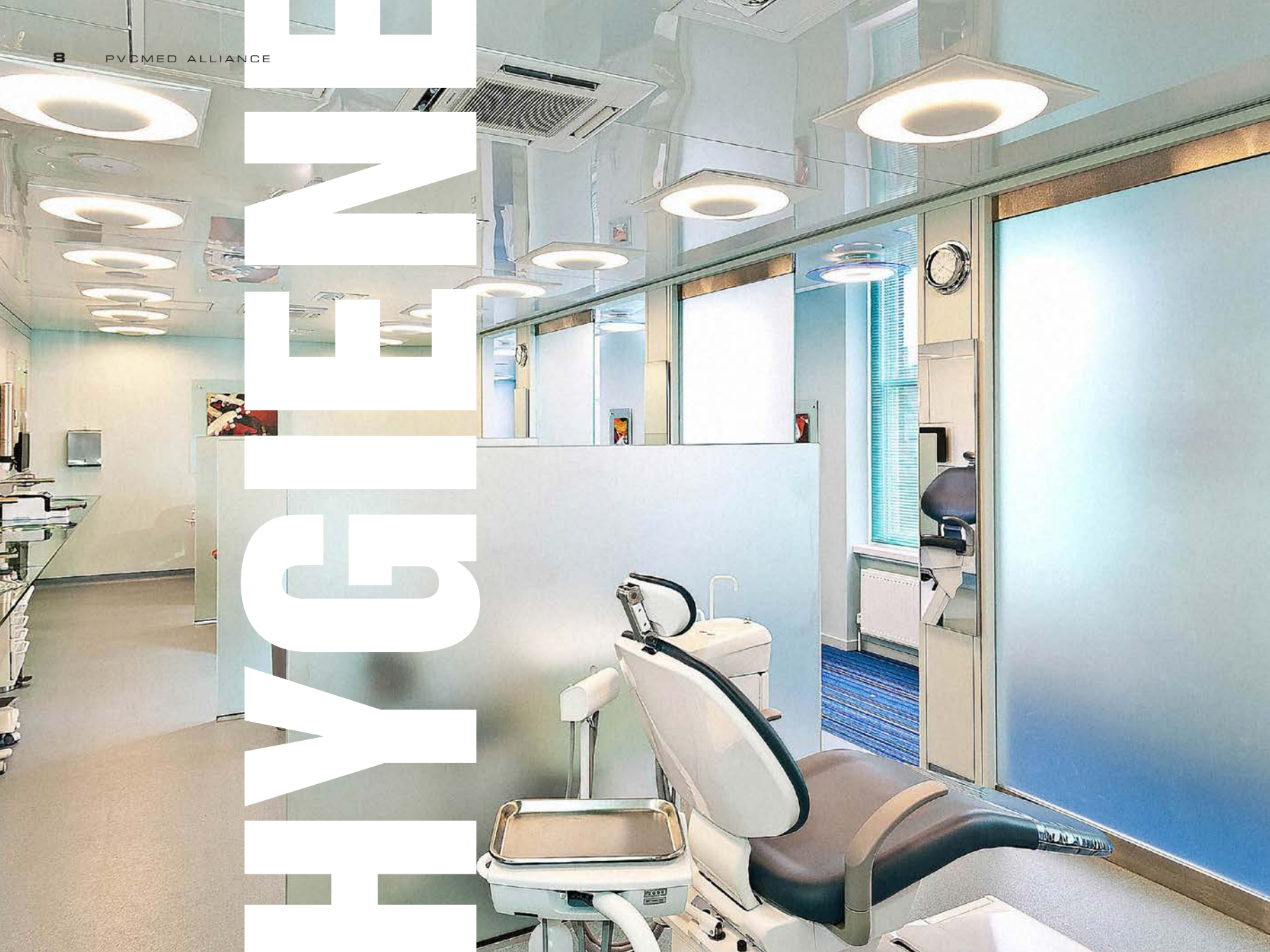
It is no secret that vinyl has been criticised for lack of sustainability in the past. To address such criticism, in the last 10-15 years, through a range of initiatives designed from a lifecycle perspective, the PVC industry has striven to move the production, use and, not least, recycling of vinyl in a more sustainable direction.

In particular the flooring industry has successfully worked towards eliminating controversial phthalates. Later in this booklet, you can read about VinylPlus and several other initiatives launched by the PVC industry to promote sustainability.

**” OVER THE LAST
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HYGIENE



Good hygiene is imperative to any hospital environment. The European Centre for Disease Prevention and Control has stated that infections occurring in clinical environments represent a serious threat to public health. Each year more than 4 million patients in the EU contract infections from hospital exposures, and 37,000 unnecessary deaths result due to such infections. As a direct consequence of these figures, in autumn 2013 the European Parliament launched a campaign focusing on cleaning in hospitals and other clinical environments.

Vinyl is already widespread in hospitals and helps to create safe environments, thanks to its unique hygienic properties. The smooth and dirt-resistant surface-structure of vinyl reduces the risk of bacterial retention and multiplication.

Hospitals have huge floor areas. Vinyl is laid in long, wide lengths which require only a minimum of welded joints. Vinyl welds are sealed and strong. The flooring is a continuous surface which dirt, bacteria and other undesirable organisms cannot penetrate. The welded joints eliminate holes



VINYL IS ALREADY WIDESPREAD IN HOSPITALS AND HELPS TO CREATE SAFE ENVIRONMENTS, THANKS TO ITS UNIQUE HYGIENIC PROPERTIES.

and leaks, and make the vinyl an unlikely breeding ground for moulds and fungi.

Vinyl flooring is also resistant to the vast majority of chemical attacks and can withstand most types of mechanical wear and tear.

Modern vinyls are optimised to reduce chemical emissions and the result is a healthy indoor climate at hospitals and other buildings.

CLEANING, MAINTENANCE AND REPAIRS

Vinyl is easier to clean than most other materials. Vinyl has a sealed, impermeable surface. It is also a highly flexible product which can be folded to form skirting or plinths (obviating the need for filler bars) and down into drains, etc. This makes cleaning easier. There are no joints or cracks in the vinyl

where dirt can accumulate. Even in heavy traffic environments – such as hospitals – vinyl can be cleaned on a daily basis using only very common, environmentally friendly cleaning agents. Most pollutants are easily removed simply by washing. Vinyl optimises the cost of running and maintaining buildings, while reducing environmental impact to a minimum.

In addition to hygiene and cleaning benefits, vinyl floor covering is hard-wearing and retains these properties throughout its lifetime. Vinyl surfaces neither fade nor erode.

Under normal circumstances you will never see a damaged vinyl floor. If you drop heavy, sharp objects, isolated damage in the form of small scratches can, of course, occur. These are easy to repair (just cut and mend by welding a patch to the existing flooring). In just three simple steps the original properties of the vinyl are quickly restored.

TOTAL COST OF OWNERSHIP



In 2011 the EVCN (European Council of Vinyl Manufacturers) ordered an independent inquiry to look into the overall economic aspects of using vinyl as a building material, including flooring. The term “Total Cost of Ownership” covers all economic costs throughout the product’s lifecycle, including the costs of purchase, installation, use, maintenance, repair and replacement.

Where flooring is concerned, there is every good reason to examine total costs. Cleaning costs in heavy-traffic areas account for up to 92% of the total cost of ownership. Choosing materials that are easy to clean and maintain leads to large savings on cleaning.

The report was prepared by Althesys Strategic Consultants. Their comparative economic analysis revealed that newer types of vinyl provide a number of economic benefits - in particular in relation to the costs of ownership throughout the product's lifecycle.

A lifecycle cost analysis completed by Västra Nylands Hospital showed that the Finnish hospital was saving € 65,000 a year on cleaning. The hospital chose a high-quality vinyl which requires no polishing. Calculated on a 24-year lifecycle, total savings run to € 1.6 million on cleaning alone. There is also an obvious environmental benefit as, over a period of 24 years, the hospital will save 58,320 litres of water, 17,136 litres of chemicals and 16,944 kWh of electricity. There is a clear connection between the level of savings and the quality of the vinyl chosen.

[Source: Tarkett]



FOR PVC BASED CONFERENCE

The PVC industry is not only striving to achieve sustainable development in hospital flooring, it is also working to promote positive development within PVC-based medical devices. For example, PVC Med Alliance has entered a fruitful collaboration with Denmark's Environmental Protection Agency and the Danish Health and Medicines Authority to evaluate alternatives to classified phthalates in PVC-based medical devices, which are still primarily plasticised using some of the controversial (classified) phthalates.

Vinyl-based medical devices have a key role to play in offering patients the most effective, qualified treatment. The positive properties of vinyl in medical devices include pliability and softness, that the material is suitable for

sterilisation, and that it is chemically stable and bio-compatible. Moreover, the material can be clear and transparent. It is durable, reliable and resistant to cracking.

To mark the end of the project, on 27 March 2014 the Danish Ministry of the Environment, the Danish Health and Medicines Authority and PVC Med Alliance held an international conference entitled "Alternatives to Classified Phthalates in PVC Medical Devices".

The organisers presented the results of a report, which concludes that it is possible to use PVC/vinyl without classified phthalates in medical devices.



Danish Ministry of the Environment
Environmental Protection Agency

PVC Med
ALLIANCE



Sundhedsstyrelsen

Danish Health and Medicines Authority

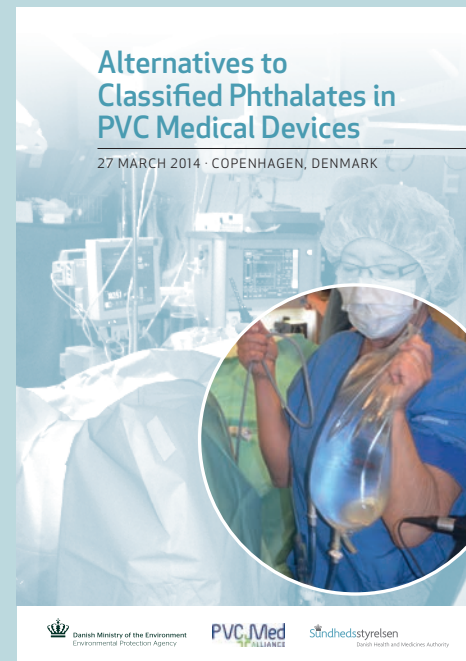
In his closing remarks, Henrik Søren Larsen, head of administration at the Danish Ministry of the Environment, said:

“We have heard how public authorities and industry have worked together to promote substitution of the controversial phthalates, and we have heard that industry has been willing to share information in support of possible alternative substances with the authorities. We can conclude that some of the alternatives appear to be preferable to DEHP. Further data needs to be collected for some of the substances discussed in the report.

The PVCMed Alliance provided the ministries with the required background material. Dr. Brigitte Dero, spokesperson for the PVCMed Alliance, emphasised that the industry is working hard to find alternative plasticisers to replace classified phthalates.

“A range of new plasticisers has been developed in recent years, and many of these are suitable for use in medical devices. This means that healthcare professionals can also benefit from the unique qualities inherent in vinyl-based devices – including patient comfort, reasonable prices and excellent hospital hygiene.”

The PVC industry is working with the authorities because it is firmly convinced that candour and dialogue will produce the best results. Dialogue and cooperation will lead to a controlled phasing-out of the controversial, classified phthalates – without compromising patient safety.



In any given hospital, about half of the medical devices used are made of vinyl. Tubing, urine bags, blood bags and transfusion packs for example, are all made of vinyl. Vinyl is also often used in work and other types of surfaces as it is durable and hygienic, requires minimal maintenance and offers few restrictions on design possibilities.



VINYLL IN HEALTHCARE

” VINYL FLOORING IS ESSENTIALLY DURABLE AND STRONG. IT IS POSSIBLE TO USE EXTRA DURABLE FLOORING IN TRANSPORT ZONES AND OTHER AREAS EXPOSED TO VERY FREQUENT, HEAVY TRAFFIC.



FLOORING

Hospital floors are exposed to heavy use 24 hours a day - 365 days a year. The benefits related to hygiene and other healthcare-related parameters are obvious. Flooring must also be beneficial for healthcare professionals' working environment and patient treatment.

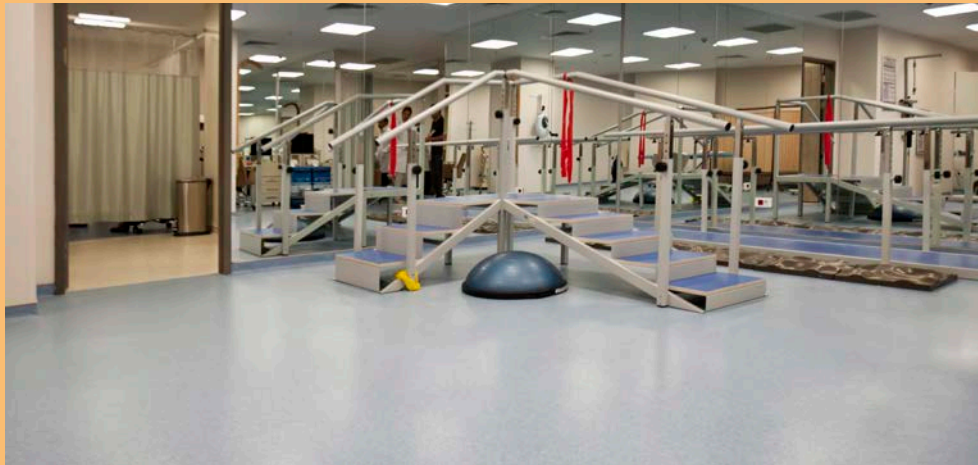
Vinyl flooring is essentially durable and strong. It is possible to use extra durable flooring in transport zones and other areas exposed to very frequent, heavy traffic. Examples include corridors where hospital beds are moved between wards and operating theatres, and operating theatres themselves, where heavy scanners and other equipment are used.





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TO MINIMISE PHYSICAL STRAIN, IT IS IMPORTANT THAT FLOORING IS NOT ONLY SOFT AND COMFORTABLE, BUT ALSO RESISTANT TO WEAR AND TEAR.



SHOCK-ABSORBENT, SAFE AND COMFORTABLE TO WALK ON

Healthcare professionals spend most of their working day on their feet. When operating or examining patients, hospital staff often have to stand for hours on end. In contrast, porters and nurses move around a lot when they transfer patients between units or when they care for patients confined to bed. To minimise physical strain, it is important that flooring is not only soft and comfortable, but also resistant to wear and tear.

Hospital flooring also has to be antistatic. The minor shocks that patients, staff and relatives

are subject to on a daily basis are one thing, but quite another, and more important matter, is to protect sensitive electronic equipment from electrostatic shocks which can cause permanent damage or render equipment temporarily unserviceable.

In laboratories and wet rooms, it is extremely important to have non-slip flooring so that staff do not slip when performing precision-demanding tasks.

Vinyl flooring is ideal as it is durable, shock-absorbent, non-slip and antistatic, and ensures that hospital staff and patients are free to move comfortably and safely.

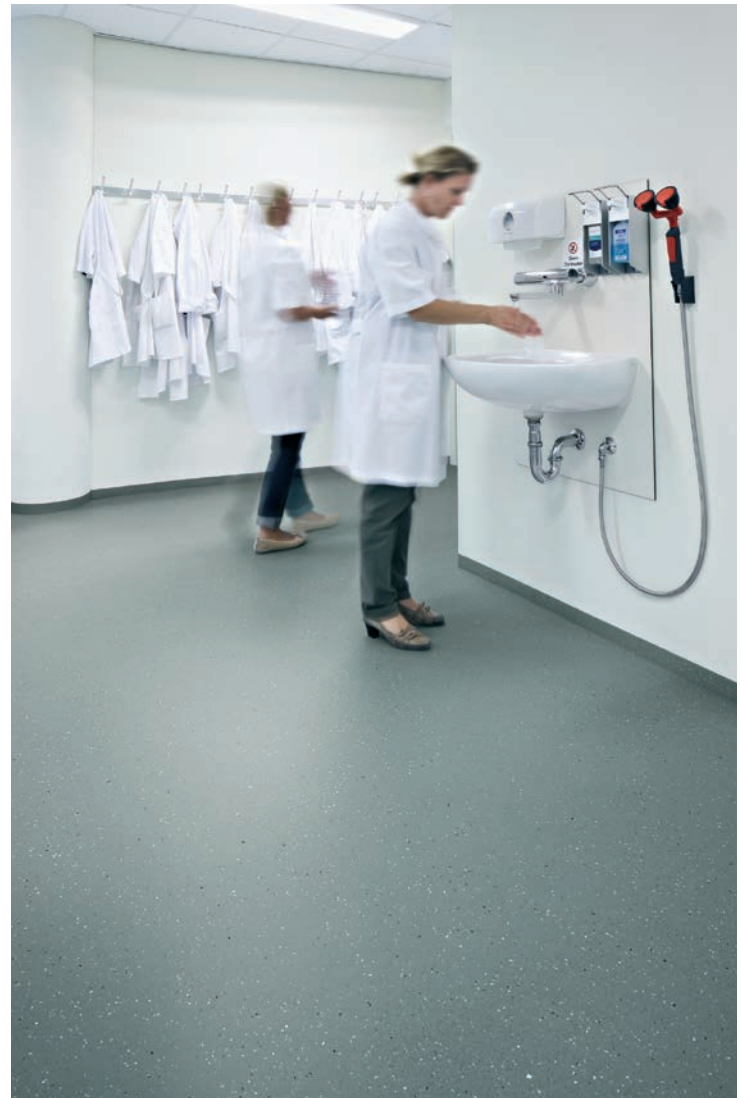


NOISE REDUCTION AND ACOUSTICS

Noise is stressful for staff, patients and relatives. In the worst-case scenario, noise pollution prolongs patients' convalescence and/or leads to stress-related absenteeism on the part of the hospital staff. In the healthcare sector, acoustics

requirements are categorised according to functional zones. Vinyl flooring, potentially combined with PVC stretched ceilings, has a beneficial effect on acoustic effect. It reduces the sound of footsteps from floors above and ambient noise, i.e. the noise in the room occupied by patients or staff

Vinyl flooring reduces sound levels everywhere, including in hospital corridors, waiting rooms and wards, and helps to create a positive healing environment for patients and a healthy working environment for staff.





NAVIGATION

Vinyl flooring allows for integration of signage, zone boundaries and even art into the flooring. This means that vinyl flooring can make it easier for patients, staff and visitors to find their way around, so that the hospital is accessible and welcoming.





” NAVIGATION AROUND A HOSPITAL HAS TO BE EASY. FROM THE MOMENT PATIENTS AND RELATIVES SET FOOT IN THE BUILDING, DURING ADMISSION AND UNTIL THE TIME PATIENTS ARE DISCHARGED.





**AS A WALL COVERING, VINYL IS HYGIENIC,
DIMENSIONALLY STABLE AND RESISTANT TO
CHEMICALS.**

WALLS

The pliability and adaptability of vinyl make it possible to apply an unbroken vinyl surface from floor to wall in operating theatres, bathrooms, kitchens, laboratories and other rooms where particularly high standards of hygiene, function and safety are required. Vinyl is also one of the best materials available to seal wet rooms.

As a wall covering, vinyl is hygienic, dimensionally stable and resistant to chemicals. Vinyl also helps to create a holistic architectural design expression. A shock-absorbent type of vinyl flooring or a resistant

vinyl sheet coverings is ideal for walls which have to be protected from collisions with beds and other types of hospital equipment.

Hospitals and clinics, as all public buildings have similar difficulties: premature deterioration together with wear and tear of their premises. Corridor walls, corners and doors are constantly knocked by trolleys and are damaged by continuous pedestrian traffic. In addition to preserving the interior, asepsis is absolutely imperative in operating theatres and clean rooms.

A range of products have been tested in order to offer the most appropriate solution

for total protection of walls and doors in medical buildings.

This solution is based on large rigid coloured PVC panels, 2 mm thick, with lightly textured surface, both resistant and decorative. They are made from colour impregnated PVC therefore colour will not alter with cleaning or time.

Panels are available in a full range of colours, they can be cut to size, or bent according to requirements. They are glued directly on the wall with either silicone joints or PVC weld joints (colour coordinated with the panels).



3CH Robert Schuman. Metz.



Polyclinique de Lormont. BDM Architectes. Nadège Petrucci.



Polyclinique de Lormont. BDM Architectes. Nadège Petrucci.

PVC panels prevent damage to doors and walls exposed to abrasion by furniture, chairs and repeated impact from trolleys in corridors, bedrooms and waiting rooms in hospitals and clinics. They are resistant to impact, scratches, wear chemical agents and cleaning products. No heavy metals are to be used in their manufacture and they are fire resistant.

A specific range of panels with a glossy surface and antibacterial properties has been developed for areas exposed to a high risk of infection in order to help in the fight against in-hospital illnesses and to reduce bacterial proliferation.

STRETCH CEILINGS FOR CLINICS

A suspended stretch ceiling system consists of two basic components, a perimeter profile and a lightweight vinyl film that stretches and clips into the track. Stretch ceiling films are designed for the decoration of interior ceilings, but are also suitable for creative applications as countless designs and structures may be realised.



DPS Stretch Ceilings

One of the advantages of stretch ceilings in hospitals is their quick and clean installation method. This helps to reduce the time of non-use due to renovation works. Suspended stretch ceilings conceal unsightly ceilings on which pipes and cabling are installed. If such elements need to be reached for maintenance works the vinyl film is easy to remove and can be refitted afterwards. In

addition, it is possible to incorporate inserts of all kind such as light fixtures, smoke detectors, sprinklers, ventilation shafts, etc.

The flexible but resistant vinyl film is available in various colors and surface finishes. Printed films may be used to design unique spaces e.g. in children's medical units. Backlit translucent ceiling films allow creating light accents or indirect lighting which make medical interventions safer.

Soft lightening and different colours of light are a means to create a more relaxed and comfortable atmosphere for patients in examination rooms, intensive care units etc. For sound absorption in noisy areas such as hallways and waiting rooms, it is recommended to use a micro-perforated stretch ceiling film.

Good flame-retardant properties are a quality characteristic of stretch ceiling films. The high ignition temperature of PVC and special fire-retardant additives in the formulation give newer types of stretch ceiling films excellent fire-inhibition properties. Films with a low flammability are available, that develop little smoke and do not drip in case of fire.



SUSPENDED STRETCH CEILINGS CONCEAL UNSIGHTLY CEILINGS ON WHICH PIPES AND CABLING ARE INSTALLED.



DPS Stretch Ceilings/real. Stretch Ceilings UK

VINYL GIVES

ARCHITECTS

FREE REIN





HUMAN FOCUS

It goes almost without saying that hospital projects have to focus squarely on human beings.

Hospitals are currently being designed with “healing architecture”. Healing architecture includes light ingress, navigation around the hospital and recreational zones. The architecture of new hospital construction

projects takes into account the needs of the patients, relatives and hospital staff. In partnership with other consultants and advisers, architects are drawing on the latest knowledge as to how physical surroundings can positively affect the healthcare sector. The aim is that architecture is to make a positive contribution to treatment processes.



AESTHETICS AND FUNCTIONALITY GO HAND IN HAND

In recent years, architects have focused more than ever before on uniting a strong aesthetic design expression with users' needs. Architects have become more skilled in developing spaces with respect for the human scale and users' specific requirements. Practical experience from different construction projects must now be carried forward in order to ensure the quality of hospital projects in future years.

Architects are consistently developing buildings that push the boundaries of what materials can deliver in the way of artistic and functional objectives. When working with vinyl, the design options are almost infinite. In hospital projects, vinyl gives architects free rein to create - without constraints related to functionality, specifications for use, aesthetics or costs.

AESTHETICS



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WHEN WORKING WITH VINYL, THE DESIGN OPTIONS ARE ALMOST INFINITE.

FUNCTIONAL



SIGNAGE AND INDICATORS

It has to be easy to navigate around a hospital from the moment patients and relatives set foot in the building, during admission and until the time patients are discharged after a successful course of treatment. Hospital staff's accessibility to patients and relatives is currently a focus area for the regional authorities, as it affects how users rate the hospital and the treatment they receive. Hospital design must clearly signal to the user, how he or she can get information or assistance from a healthcare professional.



HOSPITAL DESIGN MUST CLEARLY SIGNAL TO THE USER, HOW HE OR SHE CAN GET INFORMATION OR ASSISTANCE FROM A HEALTHCARE PROFESSIONAL.

It is possible to help users find their way by incorporating routes into vinyl flooring. Signage help to ensure an efficient flow of people through the hospital. Pathways and route signage can also be used to vary the flow of movement through the hospital. Flooring can be used to signal fast-track routes for staff to use when moving beds and medical equipment. In other places, contrasts can be used to signal slow routes which accommodate the needs of people with impaired mobility or vision, and patients recovering from surgery. Tactile indicators can also be incorporated into vinyl flooring so that the visually impaired can find their way around.

ZONE INDICATORS

Hospitals are complex micro-societies, which have to accommodate many different needs. In addition to controlling the flow of movement within the hospital, vinyl can also be used to signal zones. Individual units can be designed with their own colours, adapted to coordinate with the overarching colour code at the hospital. Open reception areas close to the main entrances and in connection with individual units can be identified using a common colour or pattern, signalling that these are information zones. Operating



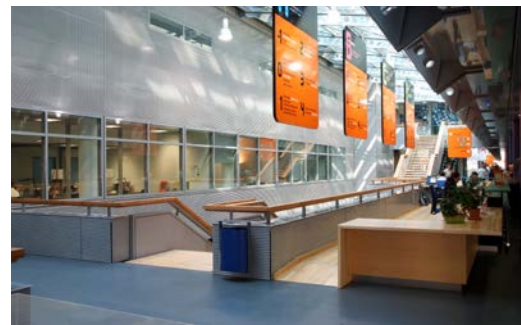
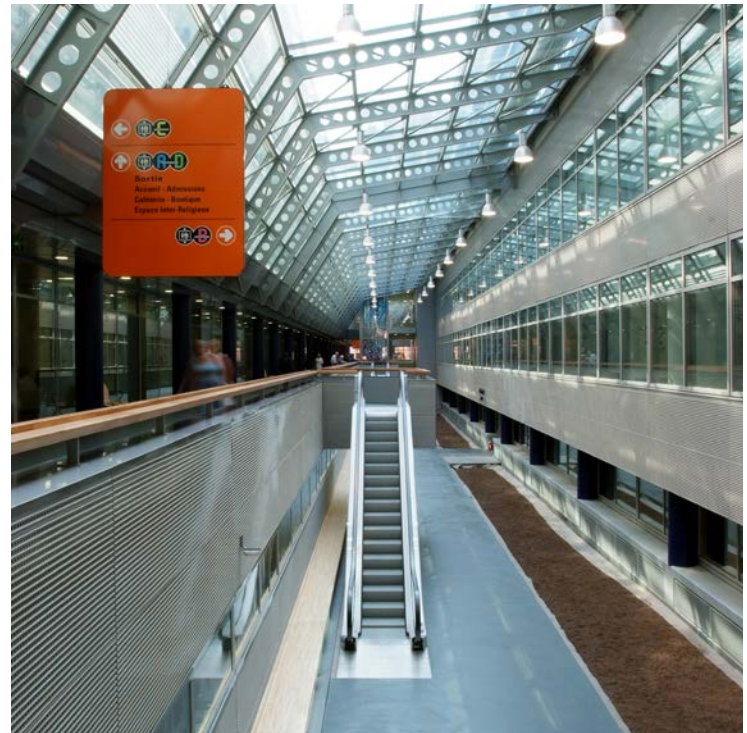
theatres can be designed with vinyl floor and wall coverings indicating professionalism, safety and hygienic control. The more recreational areas can be designed with warm, inviting floor and wall coverings to create a homely atmosphere. Cafeteria zones can be designed to show vigour and to help improve people's appetites. Incorporating figures such as animals, space rockets or castles in paediatric units creates a cosy, child-friendly environment for sick children.



IN ADDITION TO CONTROLLING THE FLOW OF MOVEMENT WITHIN THE HOSPITAL, VINYL CAN ALSO BE USED TO SIGNAL ZONES.









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ARCHITECTS ARE CONSISTENTLY DEVELOPING BUILDINGS WHICH PUSH THE BOUNDARIES OF WHAT MATERIALS CAN DELIVER IN THE WAY OF ARTISTIC AND FUNCTIONAL OBJECTIVES.



Warm and woody – creating a home away from home

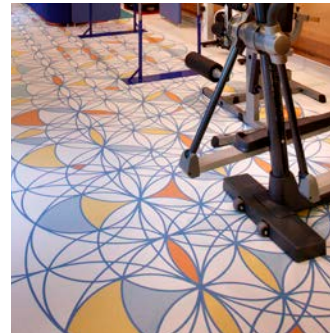
Patients admitted to hospital may be hospitalised for a long time.

In 2008, the cystic fibrosis unit at Foch Hospital in Suresnes in France underwent comprehensive refurbishment. The principal challenge was to create a homely atmosphere. Experience shows that a cosy atmosphere soothes patient's body and mind, which means that architectural design has a positive influence on humans' physical and mental well-being. Vinyl products with a simulated wood finish help to create a calm and intimate atmosphere at Foch Hospital.



ART

Research has shown that the presence of works of art in hospitals has a positive effect on patients' well-being. Vinyl provides unique opportunities to integrate art into the architectural design of the hospitals of the future. Graphical text elements, colour coding and figurative or abstract works of art can be incorporated directly into vinyl flooring or wall covering.





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RESEARCH HAS SHOWN THAT THE PRESENCE OF WORKS OF ART IN HOSPITALS HAS A POSITIVE EFFECT ON PATIENTS' WELL-BEING.

FINDING THE WAY WITH RENOLIT



RENOLIT CONTACT self-adhesive films stand out with their high performance and are perfectly suited for applications in hospitals and clinics.

Used for signage, wayfinding and decoration, colored self-adhesive films are highly opaque, extremely color consistent and available in a high range of colors and surfaces. They can be easily processed on plotting machines to letters or other required individual shapes. 'Wall tattoos' have been increasingly popular as decorating items for receptions, corridors or patient rooms as they instantly transform spaces into positive focal points.

In case a poster with a high definition picture is required, the use of self-adhesive films for printing applications is recommended. RENOLIT CONTACT films are renowned for high-resolution printing and stunning results. For 'privacy' applications, self-adhesive glass decoration films offer a good solution for hospital environments. In the past, glass surfaces had to be expensively etched to



provide privacy. Now glass decoration films offer a budget friendly alternative. Similar to coloured films, they can be cut to individual shapes or applied in full on glass surfaces. They customise and enhance hospital spaces, give the glass surface an elegant and impressive design, while preserving daylight.

All RENOLIT self-adhesive films are easy to apply on surfaces like walls, doors, windows or floors, often without any special preparation beforehand. Once installed, they



can be cleaned with conventional cleaning agents. And if a new decoration or sign is required, it can easily be removed without any residues and replaced with a new one.

Anti germs and bacteria

In addition to the durability and design attributes of laminates (PVC films), these products can be offered with antimicrobial. The protection of antimicrobial offered by e.g. RENOLIT will deactivate and retards the growth of bacteria and fungus.





**THEY DANCE
ON VINYL!**

Birmingham Hippodrome is one of the UK's most popular dance theatres. After 30 years and more than 1,000 performances, the main theatre space was to be refurbished and vinyl flooring was the natural choice. Flexibility, durability and non-slip properties were decisive: "We aim to produce world-class performances," explained Stuart Griffiths, director of Birmingham Hippodrome. "To deliver these, it is imperative that we create the best possible working conditions for our dancers, musicians and technicians." In addition to the main stage, vinyl was also laid in the orchestra pit. In both spaces, the result is a continuous surface specially designed to resist the effects of all the different types of dance and other activities.

During the refurbishment period, the theatre was closed for only four weeks. This was sufficient time to replace the floor of this old and celebrated theatre, which has been entertaining audiences for more than a century.

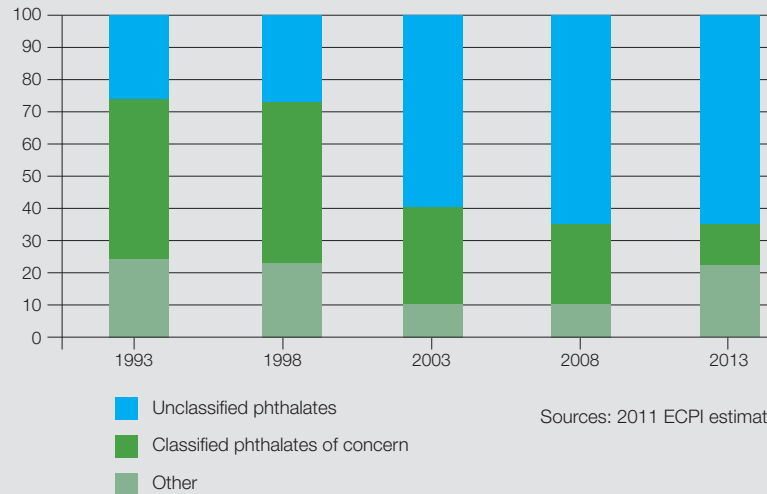
Vinyl flooring is used in world-famous cultural institutions such as the Royal Opera House, Bolshoi Theatre, Paris Opera, Houston Ballet, Beijing Cultural Centre and Sydney Opera House. Manufacturers of vinyl flooring work closely with artists, technicians and healthcare professionals to develop new types of vinyl flooring that can provide dancers with the best protection against injuries. Dancers all over the world welcome vinyl flooring - what better endorsement of the fact that vinyl flooring can minimise strain at hospitals?

VINYL AND PLASTICISERS

Vinyl has become more sustainable than most people imagine. This was, admittedly, not always the case. In the 1990s in particular, the PVC industry encountered strong opposition from public authorities and environmental organisations alike. In the past 15 years, the PVC industry has made a determined effort to make production, and, above all, recycling of vinyl, more sustainable.



The graph shows how we in the European Union are moving away from using the troublesome classified phthalates and towards using unclassified phthalates or other plasticisers



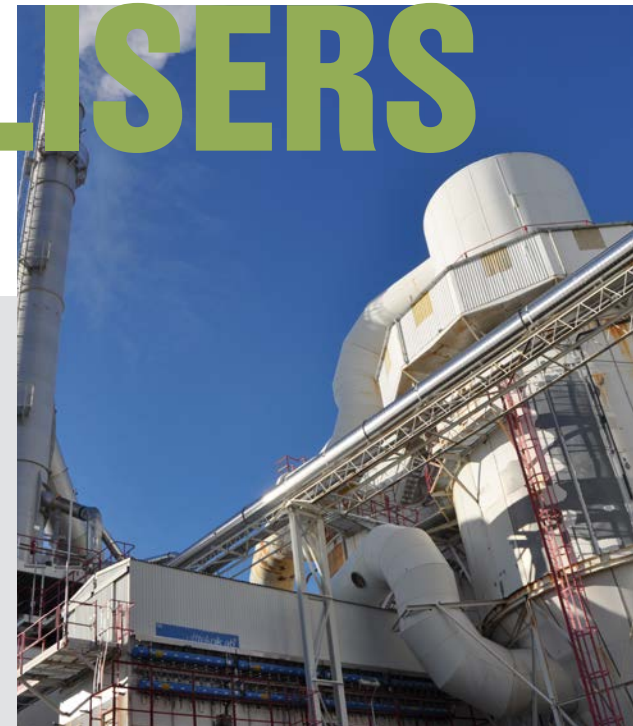
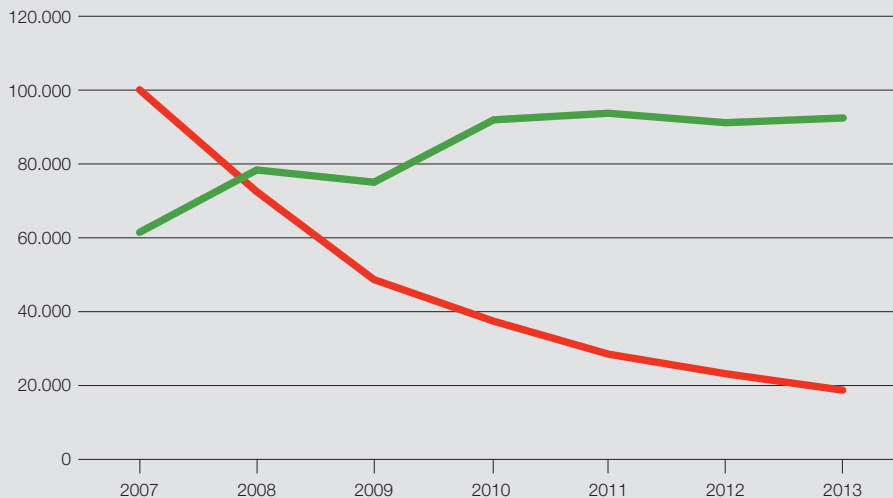
VINYL AND STABILISERS

With so much attention being paid to the environmental challenges facing the PVC/vinyl industry, European PVC industry players

have launched a series of initiatives solely focused on making vinyl more sustainable.

The graph tracks the industry's successful development away from lead-based stabilisers in recent years.

Stabilisers consumption data in the EU-27 in tonnes:



— Pb stabilisers
— Ca-based stabilisers

TARKETT PHASES OUT TROUBLESOME SUBSTANCES

Tarkett has supplied vinyl flooring to hospitals across the globe. In 2009 Tarkett launched the flooring industry's first homogeneous phthalate-free vinyl flooring. Since early in 2014, Tarkett has gradually introduced phthalate-free plasticisers at all their European factories. Tarkett previously worked to achieve low emission levels in their products by phasing out biocides and introducing recycling. Tarkett has now begun to phase out phthalates in all their vinyl products at global level. The company's goal is to produce eco-friendly products that work well in a modern, sustainable society - although not at the cost of functionality and design. The plasticiser Tarkett will use in future has been approved for use in food

packaging and toys for the under threes. Tarkett performs ongoing evaluations of its products and manufacturing processes in cooperation with the Cradle to Cradle Products Innovation Institute, an international environmental organisation which advises companies seeking to manage their products in line with cradle-to-cradle principles.

Tarkett's vinyl products inhibit bacterial growth and contain no biocidal additives. The vinyl products are tested in accordance with EN ISO 846-A/C and several Tarkett products have also been tested and approved for use in cleanroom environments.



LEARNING FROM LONDON 2012 ALTRO WINS GOLD

In connection with the London Olympic Games in 2012, the Commission for Sustainable London 2012 published a policy on the use of PVC/vinyl in connection with Olympic building projects. The intention was in fact to exclude PVC/vinyl from all the Olympic building projects and to encourage the use of other materials. Recognising that vinyl possesses a number of unique characteristics difficult to find elsewhere, the Olympic Delivery Authority (ODA) specified a series of sustainability requirements that vinyl suppliers were expected to meet. The requirements stated that most PVC/vinyl should be without phthalates, that at least 30% of these materials were to be recycled and that all vinyl materials used should meet EU norms related to emissions.

Altro was the only supplier to meet all the stipulated requirements. As a result, Altro supplied more than 90,000 m² of phthalate-free vinyl material for use as surfacing and seating in Olympic-standard stadiums, etc. Specific projects included the water polo arena, the velodrome, basketball arena, cafeterias, blood testing centre and the Olympic medical centre.

In the wake of London 2012, much of the vinyl flooring has been reused in schools and residential projects, and this is the first time that flooring has been reused on such a grand scale.



When it comes to floors, Forbo focuses on much more than function and design expression. For Forbo, everything you cannot see is just as important as everything you can. Forbo is constantly striving to develop more environmentally-sound manufacturing processes. The work involves everything from factory management to sourcing materials.

Lifecycle assessments are applied to measure products' overall environmental performance. The EPD (Environmental Product Declaration) is an internationally recognised tool which provides objective measurement of a product's environmental impact from cradle to grave. This is called a lifecycle assessment (LCA). The EPD is based on ISO 14025 and it is important to use this when comparing vinyl products with other materials. The products are measured on a range of parameters, including CO₂, raw materials consumption and the impact on water, soil and atmosphere.

Forbo recycles vinyl waste in new products, and recovers 95% of all its production waste for use in other products, specifically to minimise exploitation of natural resources and also to reduce the need to produce brand new

LOOKS AREN'T EVERYTHING AT FORBO

materials. The backing on 45% of Forbo's vinyl collections is made of recycled materials.

The flooring is produced in eco-friendly and efficient factories in Europe, powered exclusively by electricity generated from renewable energy sources. Forbo's production meets the highest possible current and future REACH compliance standards for chemical content. To prepare the company's vinyl production to meet future requirements, Forbo is continually developing intelligent material designs and durable surfaces. New micro-embossing techniques will reduce the need for chemical cleaning and prolong the lifetime of the flooring. Furthermore, like other vinyl manufacturers, as part of the industry's comprehensive vinyl programme, Forbo is making determined efforts to gradually phase out plasticisers containing phthalates.



VINYL AT BRITISH HOSPITALS

British architects are gradually warming to vinyl for their hospital projects. London-based architect firm, HOK, chose vinyl products in the design and planning of the Royal National Orthopaedic Hospital's (RNOH) outpatient department in London.



Bolsover Street, Royal National Orthopaedic Hospital



Bolsover Street, Royal National Orthopaedic Hospital



Bolsover Street, Royal National Orthopaedic Hospital

The decision to use vinyl was based on an analysis of the properties and carbon footprint of vinyl in comparison with alternative materials. In connection with this analysis, the project managers at RNOH contacted facility managers at other UK hospitals, which use both vinyl and other flooring products, to learn about their experience with vinyl floors in hospital environments. The RNOH project managers were convinced that, from a holistic perspective, vinyl was the best option. That vinyl was indeed the best choice has since been verified, as the National Health Services Environmental Assessment Tool (NEAT) described the project as “excellent”. NEAT assesses projects based on a range of factors including handling, energy, transport, water volume, materials, ecology, internal environment, pollution and waste. The vinyl products used have been awarded an A rating in the Building Research Establishment’s Green Guide.



HOK's ambitions for RNOH were to create a welcoming, light and airy building with an absolute focus on sustainability. The vinyl products were carefully chosen to match the design proposals and to meet requirements related to hygiene management, operation and maintenance, total costs and - not least - sustainability. The RNOH outpatient department covers three floors and comprises state-of-the-art treatment facilities, including clinics, X-ray and ultrasound scanning units, and a physiotherapy and pre-operative assessment room.



Bolsover Street, Royal National Orthopaedic Hospital



Bolsover Street, Royal National Orthopaedic Hospital

Senior partner at HOK, Alison Wagner, explained: "We used vinyl flooring everywhere in this project, because our aim was to create the best possible infection control environment while providing a contemporary design".



Bolsover Street, Royal National Orthopaedic Hospital



VINYLPUS JOINS GREEN INDUSTRY PLATFORM

At the end of 2013, VinylPlus officially became a member of the Green Industry Platform, a joint initiative of the UN industrial development organisation, UNIDO, and the UN environmental programme, UNEP. The Green Industry Platform partnership was launched at the RIO+20 conference on global sustainable development. The director of UNIDO's Green Initiative, Heinz

Leunberger, praised VinylPlus' decision to join. He is delighted to see that the PVC industry is taking specific steps to promote a more sustainable model for industrial production. Mr. Leunberger emphasised, for example, the massive potential in terms of efficient use of resources and recycling, which are features of the PVC industry's environmental programme.



VINYL MUST BE A SUSTAINABLE PRODUCT



Vinyl manufacturers are dedicated to making the production, use and recycling of vinyl more sustainable. Their efforts are demonstrated through their daily work at their factories and from more formal partnerships, such as VinylPlus.

The goal is to make vinyl a sustainable product and retain all its positive properties, i.e. those which make it ideal for use in hospitals and in other construction projects demanding high-level durability, comfort, design flexibility and low lifecycle costs.



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