

THERMAL, ACOUSTIC AND FIRE PROTECTION

Healthcare Facilities

Healthcare facilities have strict requirements to ensure patients benefit from the best medical care possible. Armacell's best in class equipment insulation solutions save energy and minimise maintenance or repairs. Our thermal, acoustic and fire protection solutions contribute towards a safer and more comfortable environment for patients and caregivers. **Our solutions are used all over the world, to offer trusted operations where downtime is not an option.**

www.armacell.com



 **armacell**[®]
MAKING A DIFFERENCE AROUND THE WORLD

SOLUTIONS ENABLING ENERGY SAVINGS AND ACOUSTIC COMFORT

We are the inventors of flexible foams for equipment insulation and a leading provider of engineered foams. Our lightweight thermal, acoustic, fire and mechanical protection solutions create sustainable value for our customers. Day in, day out, our products significantly contribute to global energy efficiency and make a difference around the world.

In meeting the challenges of megatrends, such as energy efficiency, lightweighting, the globalisation of food and drug supplies and acoustic comfort, our product solutions stand out in terms of functionality and ease of installation.

Armacell. Making a difference around the world.



TOWARDS COST-EFFECTIVE AND SUSTAINABLE SOLUTIONS

Healthcare facilities are highly energy intensive. The World Bank Group estimates that the health sector generates 5 percent of global CO₂ emissions (2.6 billion metric tons) annually.

Insulating mechanical equipment is one of the simplest and most efficient measures to save energy in buildings. With Armacell's insulation solutions energy costs in hospitals, health centres, nursing homes or surgeries can be decreased for many years to come.

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BEYOND THERMAL PERFORMANCE

While insulation is primarily considered in terms of its thermal performance, its contribution in healthcare facilities goes far beyond **ENERGY EFFICIENCY**. From preventing moisture and providing additional protection against bacterial growth in hygiene-critical environments to enhancing patients' comfort and implementing environmental considerations, the right type of insulation plays a significant role in the performance of a health building. When specifying insulation materials, objectives for **RELIABLE OPERATION, INDOOR AIR QUALITY, FIRE SAFETY** and **ACOUSTIC PERFORMANCE** should be taken into account.

Armacell's insulation solutions are fibre- and dust free. They ensure greater comfort for patients and minimise the risk of downtime due to unplanned maintenance work. Even renovating while the building remains operational is no sweat with our easy-to-install solutions.

ENERGY
EFFICIENCY



HYGIENE
REQUIREMENTS



ACOUSTIC
COMFORT



LONG-TERM
SAFE OPERATION



FIRE
SAFETY





SIDRA MEDICINE

Qatar

Sidra Medicine is an ultramodern, all-digital academic medical centre which was designed and built to the best international standards. This high-tech health facility consists of a 10-storey hospital, a 9-storey outpatient clinic and a 25,000m² services and office building.

To save energy and prevent condensation, the cooling-water pipes and condensate drainage of the air-conditioning systems and warm- and cold-water lines were insulated with ArmaFlex®.

ArmaFlex

Up to
75%
of energy savings
with Armacell
insulation*

HVAC systems
account for
50%
of energy
demand

* In cold standard applications
with an insulation thickness of 19 mm



While accounting for an average of just 1 percent of the total costs of the technical equipment insulation materials ensure higher performance, a longer service life and higher efficiency.



INCREASED ENERGY EFFICIENCY WITH ARMAFLEX THERMAL INSULATION

Hospitals are the most complex of building types and highly energy intensive. The global healthcare sector accounts for 5 percent of global greenhouse gas emissions. Emissions which have a negative impact on the health of the very communities this sector serves.



The energy requirement per hospital bed is greater than that of a single-family house. On average, a European hospital consumes 300 kWh of thermal and 100 kWh of electrical energy per square metre. Depending on the location, 70 percent of the energy demand is required for heat generation and 30 percent for electricity. However, as electricity is four times more expensive than gas, it accounts for 65 percent of the absolute costs. Front-runners in energy consumption are air-conditioning and ventilation systems: they require up to 40 percent of the electricity. The good news is that operators can often save up to 40 percent of electricity and 32 percent of heating costs.

OUR SOLUTIONS

Tapping the significant potential for energy savings in new and existing healthcare facilities brings benefits in terms of lower energy costs and decreased CO₂ emissions.



Our insulation solutions allow considerable energy savings at comparatively little expense. It is often wrongly assumed that a well-insulated building shell is a sufficient barrier to prevent energy losses. However, even in modern, well-insulated buildings substantial energy losses occur due to uninsulated or poorly insulated technical infrastructure.

State-of-the-art insulation of mechanical equipment is one of the most efficient and easiest ways to save energy in buildings.

ArmaFlex is our product heritage. This highly flexible, lightweight insulation features a closed-cell structure and combines a low thermal conductivity with an in-built water vapour barrier. As an independent life-cycle assessment (LCA) revealed, ArmaFlex saves 140 times more energy than is needed for its production. No other energy-saving measure pays off as quickly.

ArmaFlex saves

140

times more energy than is needed for its production





ALBERT SCHWEITZER ZIEKENHUIS

Dordrecht (Netherlands)

In 2011, the Albert Schweitzer hospital was extensively modernised and extended to a healthcare boulevard. The engineering company Deerns (Rijswijk) relied on the ArmaFlex system for insulating the mechanical equipment and specified various Armacell products in the specification. 8500m AF/ArmaFlex tubes, 5000m SH/ArmaFlex tubes, ArmaFix® AF pipehangers and ArmaFlex Protect ensure long-term reliability. The stakeholders received the ArmaFlex System Award.

AF/ArmaFlex

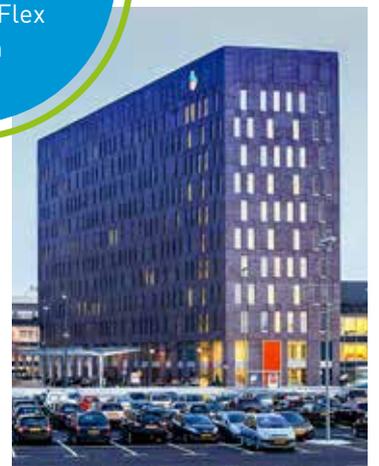
SH/ArmaFlex

ArmaFix

ArmaFlex Protect

10
YEARS

reliable operation
with ArmaFlex
system



RELIABLE AND LONG-TERM SAFE OPERATION

When planning HVAC systems for healthcare facilities, always consider creating a safe environment for patients and caregivers. Equipment insulation requirements include hygiene, reliability, safety and energy efficiency issues.



RELIABLE,
QUICK AND EASY
INSTALLATION



Reliable operation of technical equipment is paramount. Hospitals are criss-crossed by miles of pipes and air ducts. They supply the building with fresh air, cold and warm water, and dispose waste-water. In addition to air conditioning hospital rooms, chilled water ensures the necessary conditions in operating theatres and pathology rooms. Plus, cooling is needed for the operation of numerous medical-technical systems, the storage of temperature-sensitive medicines and IT areas.

For technical installations, condensation is enemy number one: if moisture forms on the surface of pipes or water vapour penetrates the insulation material from the outside, the insulation system has failed. Humidity is the source of many problems. Reduced thermal performance due to moisture intake is the least of them. Mould, corrosion, structural damage, water dripping from suspended ceilings or disruption of processes due to maintenance work can easily result in huge costs.

OUR SOLUTIONS

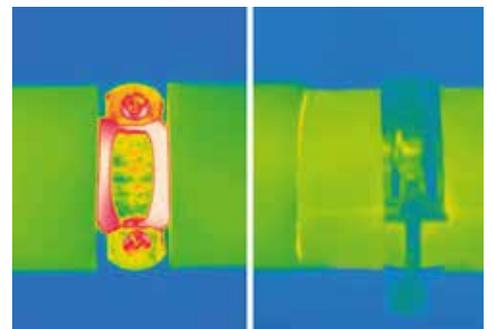
ArmaFlex is a closed-cell insulation with a high resistance to water vapour transmission. Equipment is reliably protected against condensation and energy losses throughout its service life.



We are a provider of systems where individual components fit flawlessly together and are tested as a system. ArmaFix pipehangers, our ArmaFlex Protect and other passive fire protection solutions, flexible Arma-Chek® claddings

and ArmaFlex adhesives complement and strengthen the system to guarantee long-term functionality.

To ensure professional installation we developed a unique concept: trained ArmaFlex installation partners can be certified by Armacell and receive an extended warranty on AF/ArmaFlex products. In many European countries this certification has established itself as a seal of quality.



ArmaFix pipe hangers (see above right) prevent thermal bridging and condensation, ensuring maximum reliability of the insulation system



SENGKANG HOSPITAL

Singapore

Clean indoor air is vital for a hospital. That's why our fibre-free ArmaFlex was installed on the central ducting and VRV/VRF systems of the Sengkang General and Community Hospital. The building was awarded the BCA Green Mark Platinum Award, the highest accolade for green building certification in Singapore.

ArmaFlex

Our **dust- and fibre-free** insulation protects against **micro-organisms**



In partnership with Armacell, hospitals and healthcare facilities can strive for top-notch indoor air quality.



MICROBIOLOGICAL AND HYGIENE REQUIREMENTS

Healthcare facilities have strict hygiene requirements to ensure patients benefit from the best medical care possible. However, healthcare-associated infections, the most frequent adverse event in healthcare, can lead to complications and even prolonged illness. According to the WHO, five to thirty percent of patients

develop one or more infections during a stay in hospital – a significant proportion of which could be avoided. Poor indoor air quality (IAQ) may lead to hospital-acquired infections, sick hospital syndrome and various occupational hazards. Excess moisture in combination with dust and dirt particles provides an ideal breeding

ground for microbial growth. Hospitals and nursing homes provide ideal conditions for legionella infections: patients or residents are unusually susceptible to infection, the plumbing systems are frequently complex, allowing bacteria to multiply.



OUR SOLUTIONS

Our ArmaFlex and Tubolit® insulation protect hot and cold water pipes against unacceptable temperature fluctuations which can lead to a contamination with legionella and pseudomonas aeruginosa bacteria.

Dust and fibre-free, ArmaFlex products provide protection against micro-organisms. It is much more difficult for microbes to settle on the smooth, non-porous surface of the elastomeric material than in open-cell mineral fibre and they do not find the nutrients they need to grow. Due to their closed-microcell structure and high resistance to water vapour transmission,

ArmaFlex insulation ensures reliable protection against condensation and moisture ingress. Plus, it has extremely low VOC emissions and can contribute to green building certification schemes.



Armacell is the only manufacturer of flexible technical insulation materials to provide its premium products with built-in antimicrobial protection: AF/ArmaFlex and SH/ArmaFlex are equipped with Microban®. These antimicrobial additives provide 'proactive' protection against harmful bacteria, mould and mildew.

PROTECTION THAT LIVES ON
MICROBAN®



Unprotected surface

Protected with Microban®



Photo by: Daniel Hundven-Clements

SKANDIONKLINIKEN

Uppsala, Sweden

The Skandion Clinic is the first centre for proton beam therapy in the Nordic region. ArmaFlex Ultima® was specified for the insulation of the cooling-water pipes, air ducts and other parts of the air-conditioning equipment. It was the only elastomeric material to achieve the required fire class and to be listed as non-hazardous by the Swedish institute BVB that assesses the sustainability of building materials.

ArmaFlex Ultima

ArmaFix Ultima

10
times less
smoke with
ArmaFlex
Ultima



Photo by: Daniel Hundven-Clements



FIRE SAFETY IS THE TOP PRIORITY

If a fire breaks out in a hospital the threat to life and health is much greater than in other public buildings. Nowhere else is it as difficult to evacuate a building as in care and nursing facilities. In addition to staff and visitors, vulnerable patients with restricted mobility have to be taken to safety.

What's more, damage to medical equipment could cost millions, jeopardising medical care for the catchment area. According to FM's¹ statistics, fire is the greatest danger in a hospital, causing some 34 percent of all damage. In the event of a fire, smoke poses a much greater threat than the fire itself. If a fire breaks out in a hospital, low smoke density can save lives.

¹ FM Global is an international commercial property insurance company.



The unique ArmaFlex Protect fire protection solution ensures effective thermal insulation, reliable condensation control and structure-borne noise reduction in a single product.

OUR SOLUTIONS

With ArmaFlex Ultima we have set a new safety standard in technical insulation. Based on the patented ArmaPrene® technology, ArmaFlex Ultima is the first flexible technical insulation material in the world with fire class BL-s1,d0. In comparison to a standard elastomeric product, the flame-resistant insulation material exhibits 10 times less smoke.



To prevent fire spreading from one room to another, passive fire protection has a significant impact on safety in healthcare facilities. ArmaFlex Protect and the ArmaProtect systems have fire-stopping components which seal off pipe penetrations in fire-resistant walls or floors.

At Armacell, safety comes first and maximum reliability is crucial. Our systems increase the fire safety in buildings. By mitigating the fire and smoke risk, they improve visibility and respiration, thus extending the time to safely evacuate a building in the event of a fire.





EHPAD SAINT ANTOINE DE PADOUE

Lille, France

The former Saint-Antoine hospital in Lille (France) has had an eventful history. The listed building from 1880 has been completely renovated into a state-of-the-art 325-bed nursing home. The waste-water pipes were acoustically insulated with ArmaComfort® AB Alu Plus, thus ensuring optimal noise reduction despite tight conditions.

ArmaComfort AB Alu Plus

Noise
reduction of
22 dB(A)
with ArmaComfort
AB Alu Plus on
horizontal pipes





A comfortable, stress-free environment is vital for the healing process.

A reduction of **10 dB** is perceived as **half the volume**

ACOUSTIC COMFORT IS ESSENTIAL IN CARE

High-tech medical equipment, alarms, televisions, rattling trolleys, ringing phones, and conversations between visitors, staff and patients – healthcare facilities are extremely noisy places. They will exceed WHO guideline values of 35 dB(A) during the day and 30 dB(A) at night. The soundscape of care facilities is of crucial importance since it affects the wellbeing of patients or residents and caregivers.



OUR SOLUTIONS

We offer comprehensive solutions for enhanced sound control on mechanical equipment and structural building elements. We provide an effective means of sound absorption or damping, and acoustic improvements can often be combined with the required thermal insulation.



Our ArmaFlex and Tubolit products have very good structure-borne sound insulation properties on small pipe diameters. As a system with ArmaFix pipehanger, ArmaFlex acoustically decouples pipes and ducts from the building structure and thus prevents the transmission of structure-borne noise into the building.

Our high-performance, multi-layer ArmaComfort AB solutions provide both sound reduction and acoustic decoupling of waste-water and rainwater pipes. Our latest innovation creates new types of acoustic barriers with excellent transmission reduction and ultra-thin thicknesses. ArmaComfort Barrier products allow space-saving sound attenuation of new and existing building constructions and mechanical equipment. ArmaComfort solutions are flexible and easy to install. Our premium products achieve the highest fire classification (B-s1,d0) for organic materials.

In comparison to conventional products, our multi-layer ArmaComfort AB products achieve greater noise reduction with thinner wall thicknesses.

For applications which demand a high noise absorption, such as housings for emergency power generators, heat pumps and power plants, the open-cell acoustic foam ArmaSound® RD is the ideal solution.



AT YOUR SERVICE



At Armacell, we are committed to creating an exceptional customer experience. We understand the challenges in today's healthcare industry and are here to help you complete your projects successfully. From the planning stage to the handover – our 360° service supports you throughout. At Armacell, we do all we can to ensure your project receives a clean bill of health.

ARMACELL APPLICATION TRAINING

No other insulation material can be installed as reliably, neatly, simply and as fast as ArmaFlex solutions. To ensure that our thermal and acoustic insulation materials are installed properly, Armacell has trained several thousands of installers around the world. Special training centres have been set up at many locations and we also provide valuable support on site. Several thousand insulators attend courses on installing Armacell products every year and are awarded the ArmaFlex application certificate.

EPDs FOR SUSTAINABLE BUILDING ASSESSMENT

Armacell is the first manufacturer of flexible technical insulation materials to present third-party verified environmental product declarations (EPDs). They are based on an independent lifecycle assessment (LCA) and are the key to designing green buildings in accordance with green-building schemes, such as LEED®, BREEAM®, DGNB, HQM, and others.

ARMWIN – PROFESSIONAL INSULATION CALCULATIONS

With our powerful ArmWin software you can carry out all common technical calculations in HVAC applications - even on the building site, thanks to the app. You can easily determine not only the minimum insulation thickness required for condensation control, but also surface temperature, heat flow, temperature changes in flowing and stationary media, freezing times for water pipes and the most economical insulation thicknesses, i.e. those with the shortest pay-back periods.



ArmWin
All technical insulation calculations in one tool.

BIM PLUG-IN FOR PLANNING TECHNICAL INSULATION



The future of construction is digital: Business Information Modelling (BIM) allows buildings to be planned, built and operated digitally from design to commissioning, maintenance, demolition and disposal. Armacell's BIM plug-in is seamlessly integrated in the AutoDesk® Revit® program and provides key product information. The software accesses the data required directly in the model and supports the user in choosing and configuring products.

HEALTHCARE FACILITIES AROUND THE WORLD ARE RELYING ON OUR PROVEN SOLUTIONS



TRACK
RECORD

To name just a few of the
successful projects.

// Austria

Krankenhaus Nord, Vienna
University Hospital AKH, Vienna

// Belgium

AZ Delta, Roeselare

// France

CHU Lille
CHU Poitiers
L'Hôpital Nord-Ouest, Villefranche-sur-Saône
Clinique Pasteur, Ris Orangis
Hôpital Privé de Provence, Aix en Provence
Hôpital du Grand Narbonne
CHU Hôtel-Dieu, Nantes
Hôpital Privé de Villeneuve d'Ascq
EHPAD "Les Lavandines", Roquemaure
EHPAD "St. Antoine", Lille

// Germany

Asklepios Weserbergland-Klinik, Höxter
Uniklinik RWTH Aachen
St. Vincentius-Kliniken, Karlsruhe
Städtisches Klinikum Karlsruhe
Asklepios Klinikum Hamburg-Harburg
Universitätsklinikum Schleswig-Holstein, Lübeck
Universitätsklinikum Schleswig-Holstein, Kiel
Max-Delbrück-Centrum, Berlin
DONAUISAR Klinikum, Deggendorf

// Ireland

Bons-Secours Hospital, Cork

// Kuwait

New AL Sabah Hospital

// Netherlands

RadboudUMC, Nijmegen
St. Elisabeth Hospital, Tilburg
Antoni van Leeuwenhoek Hospital, Amsterdam
Albert Schweitzer Hospital, Dordrecht

// Norway

Stavanger Universitetssykehus, avd Egersund
Akershus Universitetssykehus, Nordbyhagen

// Poland

Uniwersytecki Szpital Dziecięcy, Prokocim
Specjalistyczny Szpital, Szczecin
Wielospecjalistyczny Szpital Wojewódzki,
Gorzów Wlkp.

// Qatar

Sidra Medicine, Qatar

// Saudi Arabia

Saudi German hospital Dammam
Saudi German hospital Makkah
Security Forces Medical Center, Riyadh
Royal Oman Police hospital, Muscat

// Spain

Hospital Universitario Quirónsalud, Madrid
Clínica Universidad de Navarra, Pamplona
Hospital Universitario de Guadalajara
Hospital de Toledo
Hospital de Salamanca

// Sweden

Kungälv Hospital, Gothenburg
Skaraborgs Hospital, Skövde
Karolinska University Hospital, Solna
Skandion Clinic, Uppsala
Östra Hospital, Gothenburg
Sabbatsberg Hospital, Stockholm
Löwenströmska Hospital, Stockholm

// Switzerland

Städtisches Alterszentrum Trotte, Zürich
Inselspital, Universitätsspital Bern
Hôpital de Cery, Prilly
Kantonsspital Graubünden, Chur
Kantonsspital Baden
L'Hôpital Riviera-Chablais, Vaud-Valais

// UAE

Al Maktoum Hospital, Dubai

// United Kingdom

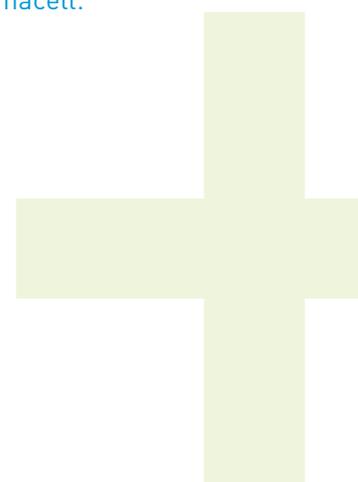
Roodlands Hospital, Haddington
Baird Family Hospital, Aberdeen
Stirling Health & Care Village
Milton Keynes General Hospital
Chelsea and Westminster Hospital

SMART SOLUTIONS FOR YOUR BUSINESS

Enjoy the benefits of our excellent customer service.

All over the world, our customers rely on sales representatives, technical consultants and applications engineers.

Your project demands more. You deserve the best solution. Get the original closed-cell thermal and acoustic solutions from Armacell.



All data and technical information are based on results achieved under the specific conditions defined according to the testing standards referenced. Despite taking every precaution to ensure that said data and technical information are up to date, Armacell does not make any representation or warranty, express or implied, as to the accuracy, content or completeness of said data and technical information. Armacell also does not assume any liability towards any person resulting from the use of said data or technical information. Armacell reserves the right to revoke, modify or amend this document at any moment. It is the customer's responsibility to verify if the product is suitable for the intended application. The responsibility for professional and correct installation and compliance with relevant building regulations lies with the customer. This document does not constitute nor is part of a legal offer or contract. By ordering/receiving product you accept the **Armacell General Terms and Conditions of Sale** applicable in the region. Please request a copy if you have not received these.

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ABOUT ARMACELL

As the inventors of flexible foam for equipment insulation and a leading provider of engineered foams, Armacell develops innovative and safe thermal, acoustic and mechanical solutions that create sustainable value for its customers. Armacell's products significantly contribute to global energy efficiency making a difference around the world every day. With 3,135 employees and 24 production plants in 16 countries, the company operates two main businesses, Advanced Insulation and Engineered Foams. Armacell focuses on insulation materials for technical equipment, high-performance foams for high-tech and lightweight applications and next generation aerogel blanket technology. For more information, please visit www.armacell.com

For product information, please visit:
www.armacell.eu


MAKING A DIFFERENCE AROUND THE WORLD