



ACOUSTIC & DESIGN SOLUTIONS

FOR **HOSPITALS** AND
HEALTHCARE FACILITIES

Build for the world we live in

CONTENTS

Welcome	4
Acoustics	6
Hygiene	10
Air quality	14
Fire safety	18
Robustness	19
Environment	20
Overview	22
– About us	23
– Products that put the 'care' into healthcare	24
– Product Guide	26
– Room by Room Guide	27



WELCOME

KNAUF: PRODUCTS THAT CARE

People have always shaped their environments to serve a particular function: we want our homes to provide comfort, our workplaces to encourage productivity and our hospitals to support good health.

Studies have shown that a hospital with a warm and welcoming physical environment can actually improve patient outcomes and recovery times, as well as having a beneficial effect on the wellbeing of hospital staff themselves¹.

*Did you know: The right architecture
and design can facilitate patient healing*

But if we want to provide healthcare facilities where the physical environment nurtures the health of patients and staff, and accurately reflects the support and care provided, we need to have a more holistic view of healing and healthcare. One that begins with the environment in which patients, doctors and visitors spend the majority of their time. This means choosing the right combination of construction materials not only in terms of functionality, but also in terms of their aesthetic appeal and design.

That's where Knauf can help. Our diverse portfolio of robust, sound-absorbing and hygiene-friendly ceilings and wall linings are the ideal choice for healthcare environments. Combining functional excellence with aesthetic appeal, our products enable the creation of superior healing spaces that encourage and support good health and wellbeing. As our systems come with the Knauf system performance warranty, you also get complete reassurance and peace of mind.

¹ Ampt A, Harris P, Maxwell M. 2008 *The Health Impacts of the Design of Hospital Facilities on Patient Recovery and Wellbeing, and Staff Wellbeing: A Review of the Literature*. Centre for Primary Health Care and Equity, University of New South Wales: Sydney.



ACOUSTICS

CREATING QUIETER HEALTH ENVIRONMENTS

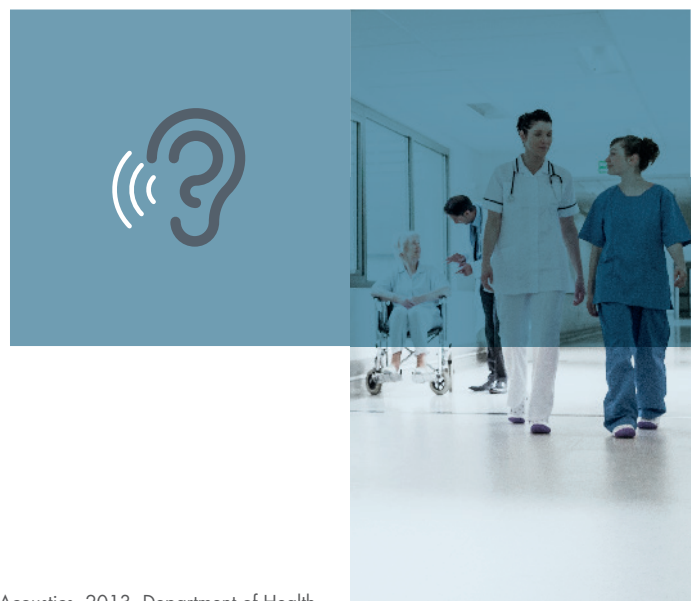
High noise levels in healthcare facilities can lead to an increase in heart rate, blood pressure, respiration rate and blood cholesterol levels². Not to mention the added stress and distractions of working in a noisy environment.

In controlling noise levels, there are two major factors to consider: the source of the noise and the widespread use of hard surface sound-reflecting materials that, although good for hygiene, add to noise levels.

Did you know: Noisy environments have a negative effect on both staff and patients

Significantly reducing the number of noise sources is unrealistic. Similarly, decreasing the use of hard surface materials is unlikely in the short term. But there is another way. By using sound absorbent materials, such as Knauf acoustic walls and ceilings, it is possible to improve control of noise levels and create positive healthcare environments.

Good acoustics can improve a patient's privacy and dignity at a sensitive time, and promote optimum conditions for healing. Improved efficiency and morale amongst staff from good acoustic design also helps to contribute to a patients care.²



² Health Technical Memorandum 08-01: Acoustics, 2013, Department of Health

Our acoustic gypsum solutions absorb up to 90% of the sound that hits their surface. They adhere to national acoustic requirements for specific reverberation times and can be tailored to fit the precise needs of different rooms, helping to create quieter, calmer atmospheres.

**GUIDANCE ON REVERBERATION FOR
OPTIMAL ACOUSTICS**

Knauf recommend that you consult the acoustic standards for relevant project requirements.

Room type	Suggested reverberation time
Consultation/Examination room	≤0.6 seconds
Foyer/Reception	0.8–1.2 seconds
Cafe/Cafeteria and communal areas	0.8–1.2 seconds
Multi-bed ward	≤0.8 seconds
Single-bed ward	≤0.8 seconds
Lounge	≤0.6 seconds
Staff room	≤0.6 seconds
Office	≤0.6 seconds
Corridors and stairwells	≤0.6 seconds



Did you know: Acoustic design is fundamental to the quality of healthcare buildings – Department of Health³



³ Health Technical Memorandum 08-01: Acoustics, 2013, Department of Health



CASE STUDY

ÖSTRA HOSPITAL, SWEDEN

"The client's job is to define function and design specifications for the new building.

Where the choice of ceiling materials is concerned, this is closely connected with what the rooms will be used for. In general, our requirement was that the ceilings should meet certain acoustic specifications, be easy to take down, facilitate the installation of light fittings and be easy to clean.

"We have had good results with Knauf products from previous hospital projects"

We have had good results with Knauf products from previous hospital projects. These results convinced me that it would be a good idea to install Knauf ceilings in corridors, lounges, activity and staff rooms in the new psychiatric wing of Östra Hospital."

– Claes Henricson, West Götaland Property
Management Authority, Gothenburg, Planning Unit

KNAUF PRODUCTS USED

- Akustikpanel Micro
- Corridor Micro
- Belgravia Micro

Architect:

Krister Nilsson, White Arkitekter





HYGIENE

PRIORITISING HYGIENE AND CLEANLINESS

Hygiene is a key importance for all healthcare facilities. Building materials therefore need to combine a high level of functionality and design with good hygiene and cleaning properties. They must also have no detrimental impact on air cleanliness – essential in preventing the spread of infections.

Did you know: Knauf gypsum products are used in high priority hygiene areas like clean rooms and laboratories across the world

Resistance to microbial growth

On most ceiling surfaces, dust and other particles infiltrate the microscopic gaps in the surface structure, making them harder to clean thoroughly. But all Knauf acoustic ceilings and wall linings are coated with a low polymer, high density paint that has a very low attraction to dust particles.

Rather than infiltrating the gaps and perforations in the ceiling, the dust sits on the surface, allowing for easy and effective cleaning using dry dusters or vacuum cleaners. Meanwhile, the durability of the coating enables tougher stains to be removed using standard cleaning practices and neutral cleaning solutions.

The appearance and reliability of any ceiling system may be affected by continuous high temperatures coupled with high air humidity, or if installed in environments prone to aggressive gases which may provoke the risk of heavy growing mould and bacteria.

Under normal conditions and in temperature controlled environments, the risk of mould growth and bacteria on ceilings is limited. In order to further minimise the risk of mould and bacteria, Knauf products are manufactured with built-in anti-mould and anti-bacteria agents. All Knauf products are tested for anti-microbial growth resistance according to EN 1104 (Determination of the migration of anti-microbial substances) Grade 3.





Clean room

In higher risk areas where outstanding hygiene and cleanliness is imperative, such as clean rooms and operating theatres, more robust cleaning regimes are essential – and Knauf has the solution here, too. Our foil-covered Danotile can withstand rigorous cleaning with concentrated disinfectants and detergents with both high and low pH values (2.5–13). This includes the mixture of peracetic acid and H_2O_2 commonly used in hospitals, where even after 120 cleaning cycles, Danotile remains ISO 5 compliant.

Air pressure control

In some areas of a hospital, air pressure variation between different zones is created in order to control airborne contamination risks for staff, visitors and patients. Danotile is especially useful in such areas as it can withstand pressure variations of up to +/- 30 Pa.

Did you know: Danotile can withstand tough cleaning and disinfection agents with pH ranging from 2.5 to 13

Access for service and maintenance

As well as being aesthetically strong and structurally innovative, our products are deliberately designed to support the functions that are carried out within the building.

Ceiling voids in healthcare facilities often hide essential services infrastructure that needs to be checked or modified fairly regularly, particularly in corridors. So we ensure that our products are easy to mount and de-mount, allowing easy access to the void for service and maintenance tasks.

As hospitals have recently shown, rapid expansion or change may be needed, so quick and easy construction of Knauf ceiling systems allow the hospital to be adaptive and react quickly to change. Just another way we build for the world we live in.



CASE STUDY

BRISTOL HOSPITAL, ENGLAND

"Our goal was simplicity and the use of as few materials as possible. Knauf ceilings contributed to this simple expression because of their discreet character. We had originally specified mineral wool ceilings throughout the hospital but changed our minds when the hospital management decided to install Danotile in most areas. We took a look at the product and found it was a very good alternative to what we had specified."

*"We had originally specified
mineral wool ceilings ..."*

The decisive factors for choosing Knauf for the hospital were infection control and cleaning. In addition the ceilings are attractive, which was important for us. The panels match and complement the radiant heat panels very well. We would not hesitate to recommend Knauf for other projects."

– Craig Bennett, Coda Architects, Bristol

KNAUF PRODUCTS USED

- Akustikpanel Micro
- Corridor

Architect:

Coda Architects, Craig Bennett



AIR QUALITY

IMPROVING AIR QUALITY

At Knauf, not only do we provide products that protect indoor air quality, our products actively improve it.

Indoor air quality in hospitals and healthcare facilities needs careful consideration, as poor air quality can be detrimental to the recovery of patients and may even spread infections.

Everyday substances like paints and lacquers, cleaning and fabric-care products, perfumes, cleaning agents and even electronic devices, all affect air quality. They create potentially harmful emissions, too, including Volatile Organic Compounds (VOCs) which are linked to allergies, asthma and even cancer.

Did you know: All of our perforated products come with the air cleaning Cleaneo Technology

All of our acoustic products contain our unique air purifying technology – Cleaneo Technology®. This has been shown to improve indoor air quality by reducing the concentration of VOCs like alcohol, aldehydes, ketones and esters.

Furthermore, independent laboratory tests at the Fraunhofer Institute for Building Physics in Germany have demonstrated the effectiveness of Cleaneo.

So as well as the superb acoustic properties and sleek, contemporary finishes you expect from Knauf, our products also offer the added benefit of dynamic air purification.



Moisture resistance

Mould and other micro-organisms are another health risk, not least for people with existing health problems.

Damp surfaces increase the chances of mould, but this can be avoided through good design and construction practices, and the use of moisture and mould resistant building materials.

All Knauf ceilings are suitable for use in 'normal' environments, i.e. up to 70% relative humidity at 25°C, making them ideal for the majority of the rooms in a hospital.

In addition, a number of our advanced solutions, such as Belgravia, Plaza, Akustikpanel and Danotile, have also been tested at 90% RH at 30°C. This means they can be used in more extreme conditions, such as kitchens, basements, laboratories and other rooms with frequent and major changes in the temperature and air humidity.



Minimising particle emissions

Fine particles emitted by building materials increase the risk of infection spreading. Some can even pose a health risk in their own right. As certified by Danish Indoor Climate Labelling (DIM), however, Knauf products have very low particle emissions. The DICL rating covers both degassing over time and particle emission.



Our products are also classified to ISO Class 5 in accordance with ISO 14644-1. And they are certified by the Swedish Sunda Hus organisation – an overall assessment of the product's environmental and health impacts.

Resistance against microorganisms and fungus

In commonly used areas, normal room conditions will naturally inhibit the growth of microorganisms. Paint coated, perforated, grooved gypsum products help maintain and enhance this natural resistance, as they do not give microorganisms any basis for growth.

In more extreme conditions like washrooms and kitchens, where the temperature and the humidity is constantly high, the foil-laminated surface of Danotile delivers extra high mould resistance.





CASE STUDY

HAMLET PRIVATE HOSPITAL, DENMARK

"Our requirements for the ceilings at Hamlet Private Hospital were that they had to be easy to clean and as light in colour as possible. Furthermore, they had to be sound absorbing in accordance with the building code.

"They had to be easy to clean and as light in colour as possible"

The wellbeing of patients and staff had to be ensured with the help of a pleasant indoor climate and clean air, the right level of humidity and a relaxed atmosphere. In addition, the interior had to give the least possible impression of a hospital. In other words, the layout, lighting and colour scheme on the walls had to create a peaceful expression.

Knauf's ceilings helped create this expression thanks to their simple, discreet design.

Our consultants' choice of Knauf as a ceiling supplier was based on the good results they have had with these products over time. As a client we are extremely satisfied with their choice as it made it possible for us to achieve the desired visual goal for the hospital's interior."

– Kasper Færk Jacobsen, Technical Manager, Hamlet

KNAUF PRODUCTS USED

– Danotile

Architects:

Aarhus Arkitekterne, Nils Jakobsen



FIRE SAFETY



A fire in a hospital can develop very quickly and have devastating consequences. Besides the incalculable human factor, hospital fires can also have significant economic consequences, as hospitals generally house very costly equipment.

Fire prevention is therefore imperative when building or renovating a hospital. So when planning, designing, and choosing material for healthcare facilities, it is essential to consider fire safety and compliance with fire regulations.

Knauf can support healthcare schemes by providing guidance on choosing the right products and systems against regulatory and standard requirements. To ensure, Knauf products are tested in accordance with EN 13501 for fire classification.

Our range of products fire classifications can be seen below:

- Danotile B-s1, d0
- Corridor 400 A2-s1, d0
- Contur A2-s1, d0
- Plaza A2-s1, d0
- Belgravia A2-s1, d0
- Akustikpanel A2-s1, d0
- Contrapanel B-s1, d0
- Solopanel A2-s1, d0
- Drypanel A2-s1, d0
- Tectopanel A2-s1, d0



STRONG ENOUGH TO LAST



Knauf products are exceptionally robust and durable. With the correct installation and maintenance, the product properties are preserved and there is no decomposition over time. This makes them ideal for the renovation, adaption and extension that is common in healthcare facilities.

Knauf ceiling products are tested in accordance with EN 14190, to ensure strong, high performing ceilings.

For more information please consult with the Knauf Technical Team.



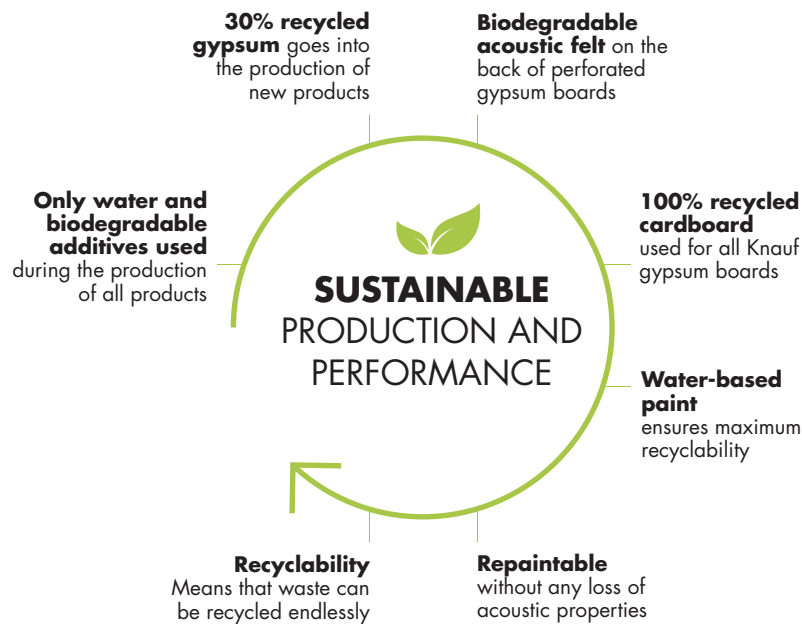
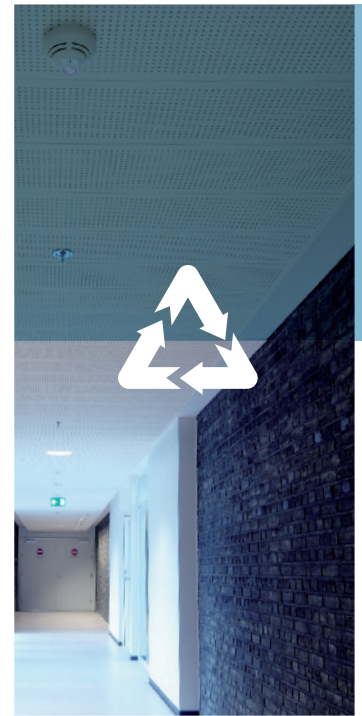
ENVIRONMENT

THE SUSTAINABLE CHOICE

Materials that regularly change their design and appearance make it difficult for healthcare facilities to maintain the same look as they are renovated or updated over time.

That's why we take care to maintain the appearance of our products, even though we are constantly improving them, enabling customers to mix and match new products with existing ones.

The environmental advantages of Knauf products are another important benefit. Our products have long-lasting durability to last as long as the building lifespan, subject to correct conditions and maintenance. Throughout that time, their properties do not change or diminish. They retain the same strength, the same acoustic characteristics and the same fire resistance. Light reflection is only affected in very dusty environments, and even then it is simple to vacuum clean the surface to remove the dust, or at worst, apply a fresh coat of paint.



Knauf products are covered by a third party EPD (Environment Product Declaration). This means that all the processes are described according to standard ISO 14025. At the end of their lifespan, our products are wholly recyclable. The crystalline agent which binds the gypsum together can be heated up. When this happens, the gypsum board turns back into a reactive powder. This is combined with waste gypsum powder created as a by-product of the cleaning process at power stations, to create new gypsum. So only a limited percentage of the gypsum in our products comes from virgin natural sources.

The other materials used to make Knauf products, such as cardboard, colouring, acoustic felt and glue, are all designed to be recyclable and re-usable, too. There is also a financial benefit, in that the long lifetime, sustained light reflecting ability and impact resistance reduces the total cost of ownership of Knauf products.

KNAUF: KIND TO THE ENVIRONMENT

- Long lifetime
- Recyclable
- Re-usable
- Re-paintable

Find all our certifications and more at www.knauf.co.uk

OVERVIEW

ABOUT US

For more information, contact our ceilings specialist

JAN WOLDANOWSKI

jan.woldanowski@knauf.com
+44 7881 512237



OUR TECHNICAL ADVISORS ARE HERE TO HELP

For any questions you may have visit **www.knauf.com** and use our Technical Services Webchat Open from 9:00 until 17:00 every weekday (except public holidays), our Technical Support Officers are ready to advise.

Technical Services Live Webchat



KNAUF SHOWROOM

Location:

20 Baltic St E, London EC1Y 0UL

Opening times:

Monday - Friday 9.30am - 5.30pm



Did you know:

You can now take a virtual tour of our Clerkenwell showroom by scanning the QR code and following the link:



Knauf Clerkenwell is a destination for inspiration, learning and collaborative working with the Architect & Design community.

Visit the showroom to discover the possibilities of Knauf products and systems which can influence your projects.

Come and speak to one of our Project Specification Managers who can help with technical advice and design as well as providing a quick specification service.

PRODUCTS THAT PUT THE 'CARE' INTO HEALTHCARE

Knauf's gypsum-based acoustic ceiling and wall materials enable architects, designers and contractors to create healthcare environments that improve patient outcomes and recovery times, as well as enhancing staff well-being – and lowering the total cost of ownership.

Acoustics

- Proven to absorb up to 90% of the sound that hits their surface.
- Adhere to national acoustic requirements for specific reverberation times.
- Can be tailored to fit the precise needs of different rooms.

Ease of cleaning

- Very low attraction to dust particles.
- Tougher stains can be removed using standard cleaning practices.
- Danotile can withstand rigorous cleaning products with both high and low pH values (2.5–13).

Air pressure, air purification and air quality

- Danotile can withstand pressure variations of up to +/- 30 Pa.
- Unique Cleaneo Technology® reduces the concentration of VOCs like alcohol, aldehydes, ketones and esters.

Moisture resistance

- Suitable for the majority of rooms – able to withstand up to 70% relative humidity at 25°C.
- Advanced solutions ideal for more extreme conditions, such as kitchens, basements and laboratories.

Minimising particle emissions

- Very low particle emissions.
- Classified to ISO Class 5 in accordance with ISO 14644-1.





Access for service and maintenance

- Easy to mount and de-mount.
- Easy access to the void for service and maintenance tasks.

Resistance against microorganisms

- Support the natural resistance to microorganisms of commonly used areas.
- Danotile's foil-laminated surface delivers extra high mould resistance.

Robustness

- Exceptionally robust with excellent pressure resistance.
- No decomposition over time.

Fire Safety

- Tested according to EN 13501-1.

Load-bearing capacity

- Can bear five times their own weight.
- Some products can bear up 3kg direct weight without extra support.

Environment

- Long-lasting durability.
- Consistent appearance.
- Excellent light reflection.
- Wholly recyclable.

All supported by the Knauf system performance warranty giving guaranteed performance and peace of mind.



PRODUCT GUIDE

	DANOTILE	CORRIDOR 400	CONTUR	PLAZA	BELGRAVIA	AKUSTIKPANEL
HYGIENE						
DIM indoor label	Best class	Best class	Best class	Best class	Best class	Best class
VOC Emission	Class A+	Class A+	Class A+	Class A+	Class A+	Class A+
Formaldehyde Content (tested by ISO16000)	Less than 0.05 mg/m ² h	Less than 0.05 mg/m ² h	Less than 0.05 mg/m ² h	Less than 0.05 mg/m ² h	Less than 0.05 mg/m ² h	Less than 0.05 mg/m ² h
HTM 60 Category	3, 4, 5, 6	2, 6	2, 6	2, 6	2, 6	2, 3, 4, 5, 6
ISEGA grade*	3	3	3	3	3	3
SURFACE CLEANING						
Moisture Resistance	90% RH and 30°C	90% RH and 30°C	70% RH and 25°C	90% RH and 30°C	90% RH and 30°C	90% RH and 30°C
Resistance to Disinfectants	EN 12720/ No changes	Can vary by the paint applied**	Can vary by the paint applied**	Can vary by the paint applied**	Can vary by the paint applied**	Can vary by the paint applied**
Cleaning	Damp cloth Vacuum cleaner High pressure	Damp cloth Vacuum cleaner	Damp cloth Vacuum cleaner	Damp cloth Vacuum cleaner	Damp cloth Vacuum cleaner	Damp cloth Vacuum cleaner
AIR PURIFICATION						
Up to 70% reduction of formaldehyde***		✓	✓	✓	✓	✓
ACOUSTICS						
NRC Rating	0.05	Up to 0.95	Up to 0.90	Up to 0.90	Up to 0.90	Up to 0.75
α_w	–	Up to 0.95	Up to 0.95	Up to 0.95	Up to 0.95	Up to 0.70
EN 11654	–	Class A	Class A	Class A	Class A	Class C
LIGHT REFLECTION						
% Reflectance	86.3%	From 70.9% to 82.6%	From 69.2% to 82.6%	From 69.2% to 82.6%	From 69.2% to 82.6%	Dependent on paint used
REACTION TO FIRE						
EN 13501 labelling	B-s1 ,d0	A2-s1 ,d0	A2-s1 ,d0	A2-s1 ,d0	A2-s1 ,d0	A2-s1 ,d0
SUSTAINABILITY						
LEED/BREEAM credit opportunity	✓	✓	✓	✓	✓	✓
EPD****	✓	✓	✓	✓	✓	✓

* ISEGA is a testing standard that analyses growth of microorganisms on the surface of products. An ISEGA grade 3 shows that there is no growth of microorganisms on the product's surface.

** The ability of our painted products listed above (not including Danotile) to combat bacteria, resist disinfectants and purify air, can be altered through the chemical properties of the paint mixture that is applied to the panels. Please contact us to discuss the options available.

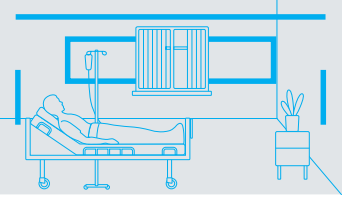

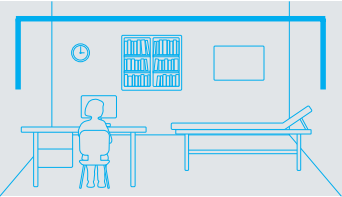

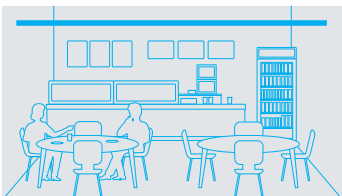
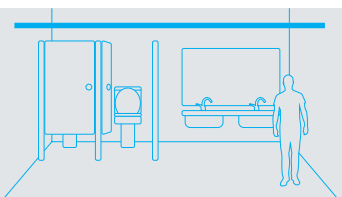
*** Also heavily reduces a number of other toxic and non toxic VOC's.

**** EPD = Environment Product Declaration.

ROOM BY ROOM GUIDE FOR HEALTHCARE

Simply the right solution

Creating a comfortable and healthy workspaces is a matter of uniting acoustic comfort, fresh air, beauty and durability. It's that simple – with the right solution.

ROOM FOR...	RECOMMENDED PRODUCTS	HYGIENE LEVEL (HTM 60)	ACOUSTIC / COMFORT	SERVICE LIFE	AMOUNT & PLACEMENT OF ACOUSTIC MATERIALS
 <p>Recovery Room/Wards Privacy. Bright, comfortable surroundings. Work environment for staff.</p>	Belgravia, Plaza, Contur, Akustikpanel, Danotile	3	<p>Reduce hard sounds - absorb high frequencies</p> <p>Optimise daylight (with light diffusing material)</p> <p>Calm atmosphere</p>	<p>Robust, longlasting material</p> <p>Repainting without acoustic loss</p> <p>Easy access to concealed services</p>	100% ceiling surface Recommended rev. time: 0.5-0.6 sec.
 <p>Corridor Bright, comfortable surroundings.</p>	Corridor 400	3	<p>Reduce noise</p> <p>Optimise daylight (with light diffusing material)</p> <p>Calm atmosphere</p>	<p>Quick access to concealed services</p> <p>Repainting without acoustic loss</p> <p>Robust, durable materials</p>	100% ceiling surface Recommended rev. time: 0.6-0.7 sec.
 <p>Consultation/Examination Room Confidential atmosphere. Bright, comfortable surroundings. Work environment for staff.</p>	Belgravia, Plaza, Contur, Akustikpanel	3	<p>Speech and listen comfort</p> <p>Optimise daylight (with light diffusing material)</p> <p>Calm atmosphere</p>	<p>Robust, longlasting material</p> <p>Repainting without acoustic loss</p> <p>Easy access to concealed services</p>	100% ceiling surface Recommended rev. time: 0.5-0.6 sec.
 <p>Lab/Operating Room Hygiene. Work environment for staff.</p>	Danotile as hygiene ceiling	5	<p>Absorb low frequency sounds</p> <p>Minimise dust deposits (use dust-repellent ceiling surface)</p>	<p>Hygiene & cleaning</p> <p>Robust, longlasting material</p> <p>Easy access to concealed services</p> <p>Minimise dust deposits (use dust-repellent ceiling surface)</p>	100% ceiling surface Recommended rev. time: 0.7-0.8 sec.
 <p>Café/Communal Areas Lively atmosphere. Noisy. Many people.</p>	Belgravia, Plaza, Contur, Akustikpanel, Danotile	3	<p>Reduce noise</p> <p>Calm atmosphere</p>	<p>Robust, longlasting material</p> <p>Repainting without acoustic loss</p> <p>Easy access to concealed services</p>	100% ceiling surface Recommended rev. time: 0.5-0.6 sec.
 <p>Bathroom/Washing Facilities Hygiene. Easy to clean.</p>	Danotile as hygiene ceiling	4	<p>Minimise dust deposits (use dust-repellent ceiling surface)</p>	<p>Hygiene & cleaning</p> <p>Robust, longlasting material</p> <p>Easy access to concealed services</p>	100% ceiling surface Recommended rev. time: 0.7-0.8 sec.



Customer Service

UK Tel: 0800 521 050
Eire Tel: 01 4620739
Email: cservice@knauf.co.uk

Technical Support

Live Webchat 09:00–17:00
Email: technical@knauf.co.uk

Literature

UK Tel: 03700 613 700
Eire Tel: +44 3700 613 700

Website

www.knauf.co.uk
www.knauf.ie

Knauf
Kemsley Fields Business Park
Sittingbourne
Kent ME9 8SR

Knauf
87 Broomhill Road
Tallaght
Dublin
D24 WR85



KNAUF