



INTRODUCTION TO ACOUSTICS

It is a growing understanding that noise can have an extremely detrimental effect in the workplace, in schools, hospitals and multi-dwelling residential properties, which can significantly affect an individuals well being and also hinder respective teaching, learning, working and recuperation.

Polyflor acoustic vinyl floorcoverings have been designed and developed to assist in improving the acoustic properties within residential, commercial and public locations as well as providing the additional benefits of aesthetics, performance, hygiene and durability.

General points to consider

Planning and room layout can be used to avoid impact noise sources on floors above noise-sensitive rooms. In addition to Polyflor's acoustic floorcoverings, floating floor constructions and independent ceilings can be effective means of isolation.

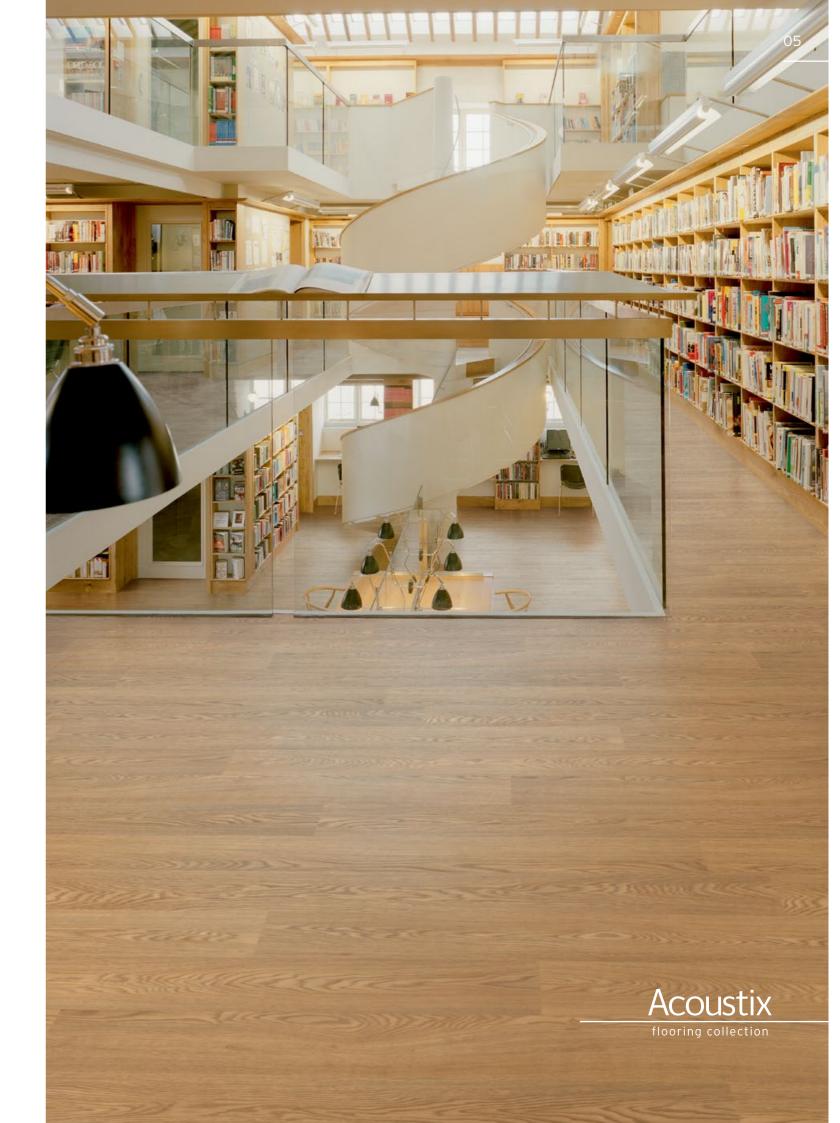
Other sources of noise to consider when planning your interior are:

- Traffic
- Weather
- Plumbing
- Ductborne noise
- Noise via open windows

Acoustic flooring is only part of the action that can be taken to reduce noise levels. Acoustic ceiling and wall panels, fabrics, textiles and plants may also be considered early in the design process to ensure compatibility. Unnecessary indentation from chairs, for example, can be avoided by choosing suitable leg detail to spread the load and pads to protect the floor and assist in deadening the sound.

Smooth acoustic floorcoverings are designed to reduce impact sound at source, not to reduce background or reverberation sound within a room.

It is advisable from the outset of a project to seek advice from a specialist acoustician as the subject requires considerable expertise. For more information visit the **Association of Noise Consultants** website at www.theANC.co.uk.



SOUND AND THE NATURE OF SOUND

Sound is usually generated by the vibrations of a surface, which increases the pressure fluctuations in the air or some other medium. Sound is transmitted through sound waves and may be described in terms of sound pressure, sound energy or sound power. Noise is generally defined as unwanted sound.

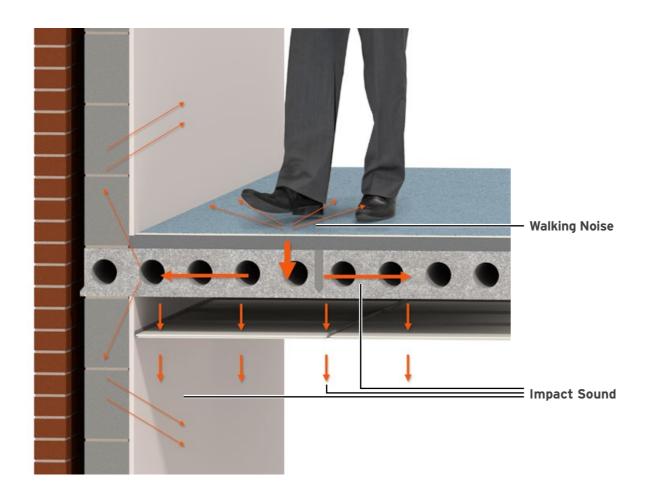
Impact Sound

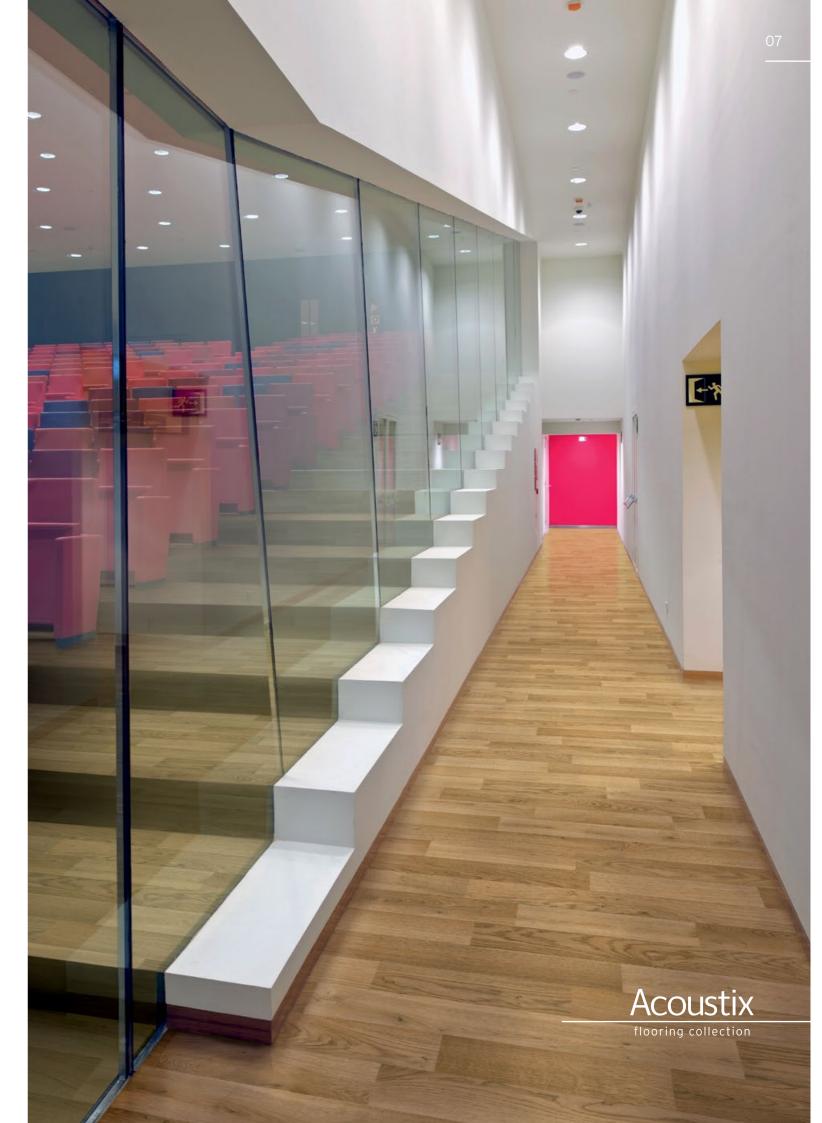
Noise is created when the sound energy transmitted either by impact or by air. Impact sound is energy produced by the collision of solid objects transmitted through the structure of a building such as **footsteps**, slamming of doors or dragging of furniture.

Noise levels transmitted through floors by impact sound can be reduced by acoustic planning at the outset of a project and by correctly installing a Polyflor acoustic floorcovering.

Walking Noise

Walking Noise unlike Impact Sound is where the sound of a person's footstep when walking in a room is reverberated back into the room through the air. Though Walking Noise is not currently regulated by a standard, it is still an important factor to consider when trying to reduce sound levels.





ACOUSTIC TESTING STANDARDS

The Impact Test

The impact test measures the sound level downstairs when a standard tapping machine is operating upstairs. This is intended to replicate noise such as footsteps and the moving of furniture which travels through the separating floor. The result is shown as the weighted standardised Impact Sound Pressure Level, or L'nT,w and the lower the sound pressure level downstairs the better the insulation.

Impact sound insulation is measured in terms of an absolute sound level so that a lower number indicates that the standard of impact sound insulation is better. Sound levels and sound insulation values are expressed in decibels (dB).

Exceeding the Standard

Throughout many countries, legislation has been introduced to address resistance to the passage of sound. In the UK for example, **Building Regulations**¹ stipulates that a suitable floorcovering should have a weighted reduction in impact sound pressure level **of not less that 17dB** when measured in accordance with EN ISO 140-8 and calculated in accordance with EN ISO 717-2.

All Polyflor acoustic floorcoverings meet and exceed these standards with a minimum reduction level of at least 18dB.

Polysafe Wood fx Acoustix, Acoustix Forest fx and Acoustix Gallery fx further exceed this with reduction levels of 19dB.

 $^{\rm 1}$ Building Regulations Part E in England & Wales, Section 5 for Scotland, Part G for Northern Ireland

Achieves 19dB impact sound reduction

ACOUSTIC PERFORMANCE

20dB		 	
19dB		 	
18dB		 19dB	 Building
17dB	18dB		 Regulations Standard 1
16dB	Acoustifoam +	Acoustix Forest fx	
15dB	Polyflor 2mm Product	 Acoustix Forest IX Acoustix Gallery fx	
1306		 Polysafe Wood fx Acoustix	





SCHOOLS AND EDUCATION STANDARDS

The learning environment is forever evolving. The creation of pleasant and comfortable surroundings facilitating various patterns of group working is bringing a new focus to school design and build.

School buildings are often subject to detailed design checks and on-site inspections by building control officers. Acoustic flooring can be a necessary part of a school building specification from the outset, working alongside building regulations and end user requirements to prevent expensive remedial work after completion of the project.

As the floor of any room represents a significant proportion of the surface area defining the space, its acoustic qualities play a role in establishing the acoustic environment of the room. For larger spaces, this proportion is particularly high. Good acoustic standards in teaching areas are crucial as acoustic conditions can have a profound impact on pupils learning and staff performance.

Recommended areas for acoustic floorcovering:

- Corridors
- Classrooms
- Reception / meeting areas
- Rooms over noise-sensitive areas

Noise reduction benefits:

- Reduce disruption from neighbouring classrooms
- Allow louder teaching areas i.e. music rooms, to neighbour quiet study areas
- Aids children's education by reducing distracting background noise
- Provide better learning environment for children with hearing difficulties



SCHOOLS AND EDUCATION STANDARDS

Alongside the Building Regulations¹ legislation in the UK, which specifies the impact sound reduction level that must be achieved in all new buildings and refurbishments, the **Building Bulletin 93** standard was introduced specifically for the school and education market.

The aim of this standard was to:

- Provide a regulatory framework for the acoustic design of schools in support of the building regulations
- Give supporting advice and recommendations for planning and design of schools
- Provide a comprehensive guide for architects, acousticians, building control officers, clients and others involved in the design of new school buildings
- Satisfy the School Premises Regulations and the Disability Discrimination Act

When planning a new acoustic project, the relevant regulations to the country of use should be studied to ensure the correct recommendations are adhered to. For more information on Building Bulletins 93 visit www.bb93.co.uk.

Polyflor's Acoustix range is suitable for use in corridors, classrooms and dining halls

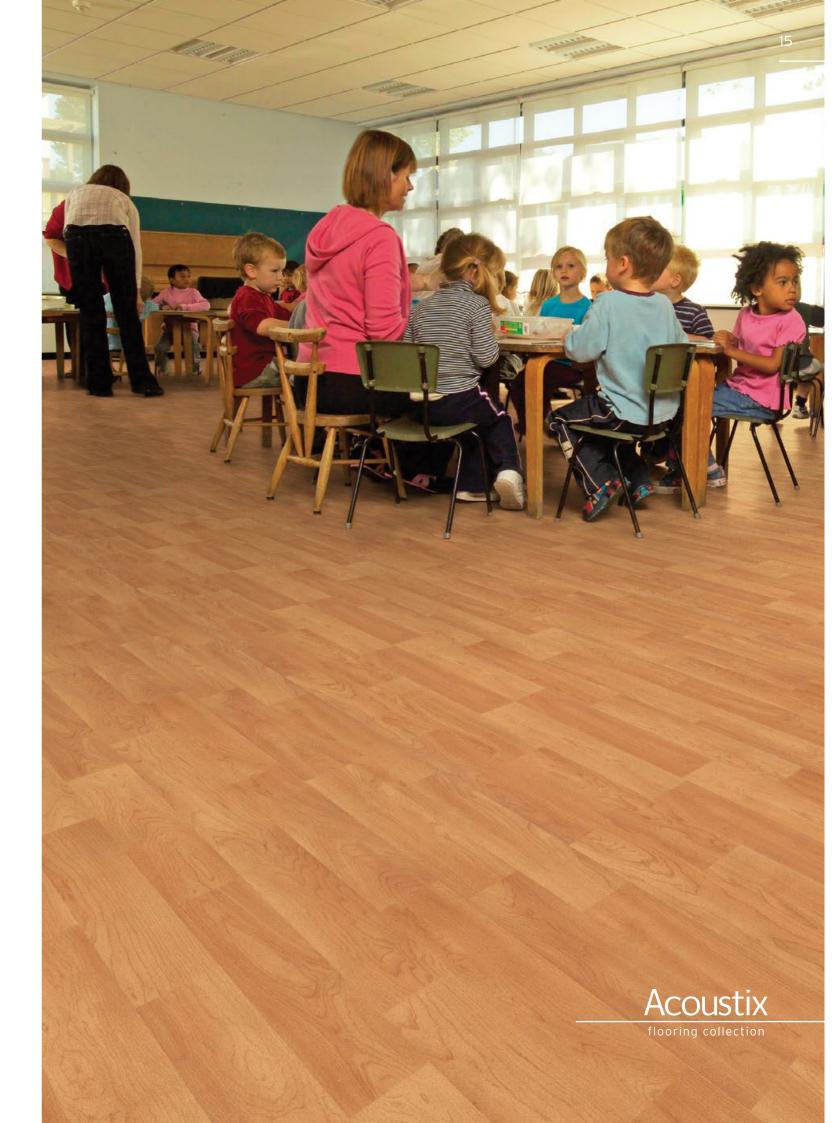












HOSPITALS AND HEALTHCARE SECTOR

21st century healthcare design is about achieving a homely, relaxed and professional environment for patients, staff and visitors. The choice of building materials and floorcoverings can have a major impact on the feel and performance of a hospital. When part of a complete design concept, floors can even aid the healing process and product choice can be key to achieving a positive contribution to patient care.

Put simply, hospital floors must perform. Criteria such as hygiene, maintenance, durability, slip resistance and aesthetics are vitally important, as are budget, availability, acoustics and environmental issues. Polyflor can advise on product suitability for any area within a healthcare facility to ensure all these points are covered.

Due to these maintenance and hygiene concerns, Polyflor's acoustic vinyl floorcoverings are specifically designed for practical spaces as alternative soft floorcovering such as carpet may not be functional because of their effect on indoor air quality and resultant health implications.

Recommended areas for acoustic floorcovering:

- Corridors
- Wards
- Reception / waiting areas
- Retail areas

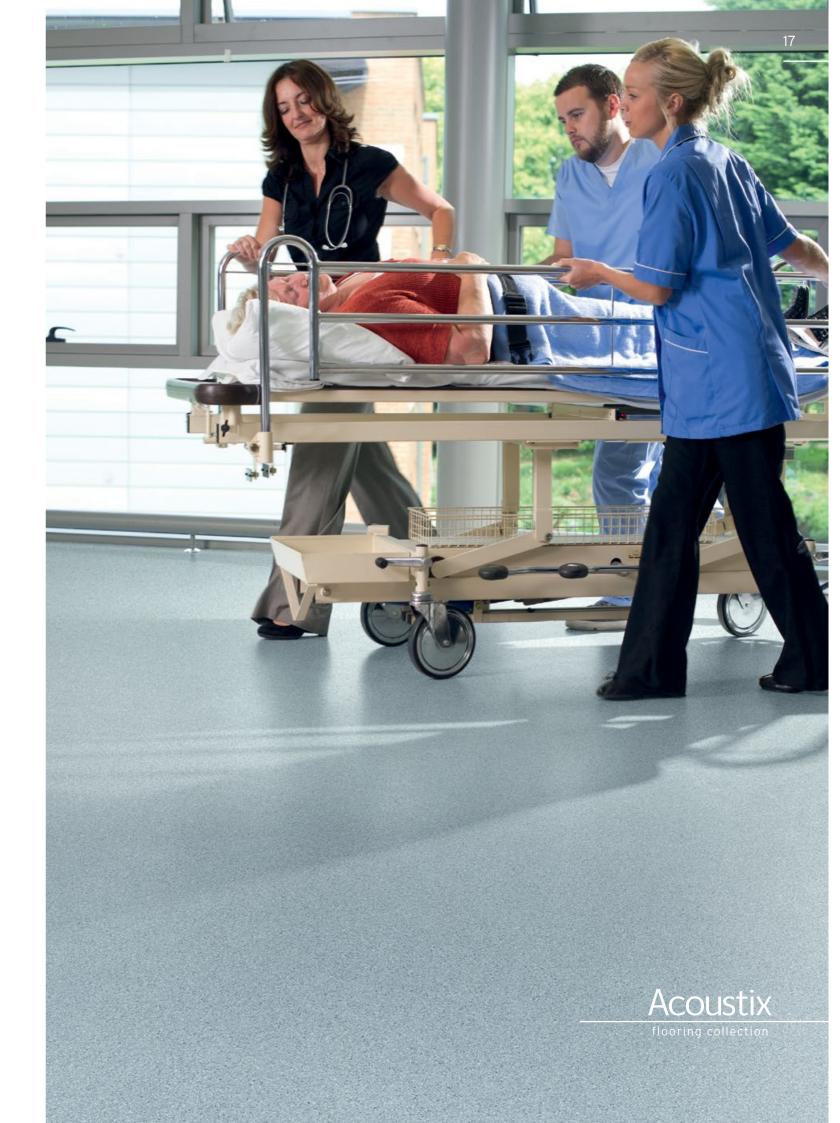
Noise reduction benefits to patients and staff:

- Lowered readmission rates
- Improved patient satisfaction with services provided
- Reduced blood pressure and lowered stress levels
- Improved team spirit and work satisfaction
- Less sleep deprivation
- Reduced need for pain medication

Acoustic benefits

Research shows noise levels in hospitals worldwide are perceived to be very high. At the same time, the awareness of the negative effects of noise on patients and healthcare staff has grown. It is likely that impact sound reduction will become a strong focus in all future developments to help reduce these effects.

The negative effects of high sound levels on staff include burnout and depression, increased number of medical errors and increased chances of hearing loss. A well planned acoustic environment enhances the feeling of privacy, safety and comfort.





RESIDENTIAL PROPERTY SECTOR

Unwanted noise within multi-dwelling properties can play a huge part in contributing to an unhealthy, uncomfortable and unwelcome environment for those living there. Many of the noise issues faced by residents including furniture scrapping across the floor and footsteps, can cause heightened stress levels, discomfort and lack of sleep.

To tackle the important issue of noise, and increase the well-being of all residents, the Building Regulations¹ standard was introduced in the UK to address the noise level suffered by occupants, leading to separating floors having to be constructed to achieve certain sound insulation levels. The documents are clear in separating out 'dwelling houses' verses 'room for residential purpose' to which the impact sound reduction level of 17dB does not apply. 'Room for residential purpose' is defined as a room or a suite of rooms which is not a dwelling-house or flat and is used by one or more persons to live and sleep.

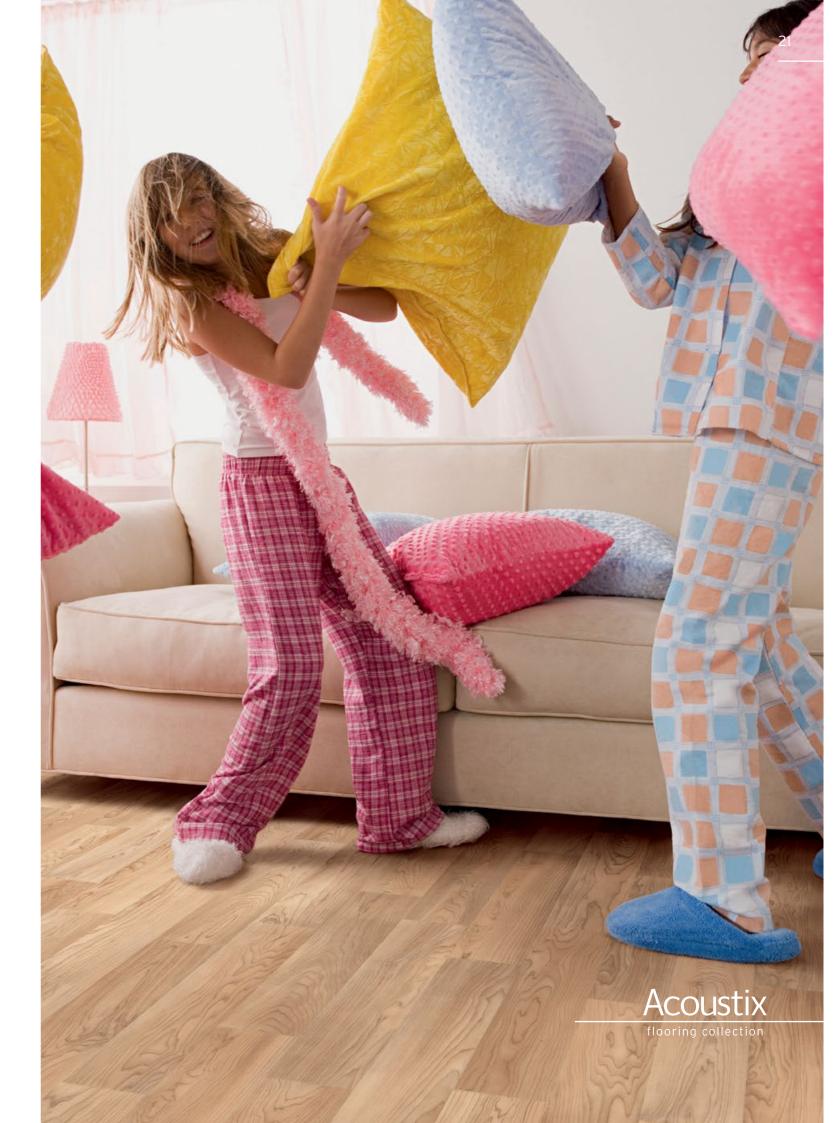
This includes	rooms in a:
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- Hostel
- Hotel
- Boarding House
- Hall of Residence
- Residential Home

But this building regulation does NOT include a room in a hospital i.e. patient accommodation (see Hospitals and Healthcare Sector).

In the case of 'dwelling houses', the documents state 'dwelling-houses, flats and rooms for residential purposes shall be designed and constructed in such a way that they provide reasonable resistance to sound from other parts of the same building and from adjoining buildings and that internal floors also provide reasonable resistance to sound'.

Polyflor's range of acoustic floorcoverings has been designed to meet the demands of today's residential market, combining contemporary mineral and wood designs with durability, slip resistance and easy-clean polish-free technology, all in an easy to install vinyl sheet format.







Acoustix Forest fx



The natural environment is the primary inspiration for Acoustix Forest fx. Sophisticated and highly realistic designs are the elements which form the collection.

With a varied tonal palette of 8 designs, including popular Oak, Beech and Walnut effects, the collection of heterogeneous vinyl sheet floorcoverings has excellent durability and is highly suited to high traffic commercial interiors. Targeted primarily at the education, healthcare, retail, leisure and office sectors, the outstanding appearance and performance characteristics are as appealing to the broad commercial market.

Featuring a closed-cell foam backing, Acoustix Forest fx provides an impact sound reduction level of at least 19dB, exceeding UK Building Regulation requirements.

The collection also importantly features a polyurethane reinforcement (PUR) which provides enhanced protection and an easier life-long, polish-free maintenance regime leading to overall maintenance cost savings.

Where can it be used?

Acoustix Forest fx is suitable for general heavy footfall areas, including:

- Very heavy commercial areas within schools and educational buildings, hospitals and healthcare facilities and general commercial spaces. Specific areas include corridors, classrooms, reception and waiting areas, wards and general locations where impact sound reduction is a key requirement
- Residential areas such as aged-care, social housing and student accommodation. Also see the Acoustix Gallery fx collection (page 24-25) as it is specifically designed for residential interiors
- Ergonomically, the flooring is suitable for 'workstations' and serving points within retail and other areas due to its underfoot comfort and anti-fatigue benefits, where users stand for long periods













3095 Oiled Oak



29



3345 European Oak



3125 Classic Oak





3295 Warm Beech



3155 Smoked Oak





3335 Rustic Oak



3235 Classic Walnut





Wide plank design



Wood fx Acoustix



Polysafe Wood fx Acoustix brings together the key attributes of safety, aesthetics and acoustic performance for complete piece of mind across a commercial or residential facility.

Available in 8 popular wood effects, each design incorporates clear aluminium oxide particles throughout the wear layer to provide sustainable slip resistance for the product's guaranteed life. Fully compliant with Health and Safety Executive Guidelines, the range achieves a result of 36+ on the Pendulum wet test with a surface roughness of $>20\mu m$.

Complete with an integrated foam backing that gives an **impact sound reduction level between rooms of at least 19dB**, Polysafe Wood fx Acoustix exceeds UK Building Regulation requirements. The product is an ideal specification for quieter working and living environments which require additional slip resistance.

With a polyurethane reinforcement giving improved maintenance, the range is equally at home in heavily trafficked commercial areas at the front of house or traditional safety locations with risks of water spillage.

Where can it be used?

Polysafe Wood fx Acoustix is suitable for use in areas which have risks of water spillage at front or back of house, including:

- Residential areas within aged-care, social housing and student accommodation. Typical use areas include corridors, circulation areas, hallways, living quarters, bathrooms and kitchens
- Heavy commercial areas within education and healthcare facilities. Typical use areas include bathrooms, washrooms, toilets, changing rooms, wards, corridors, circulation areas, classrooms and receptions
- Ergonomically, the flooring is suitable for 'workstations' and serving points within retail and other areas due to its underfoot comfort and anti-fatigue benefits, where users stand for long periods













3292 Warm Beech



3302 Cherry



3332 Rustic Oak



3342 European Oak



3352 Silver Oak



3382 American Oak



3362 Mahogany



3992 Brazilian Walnut

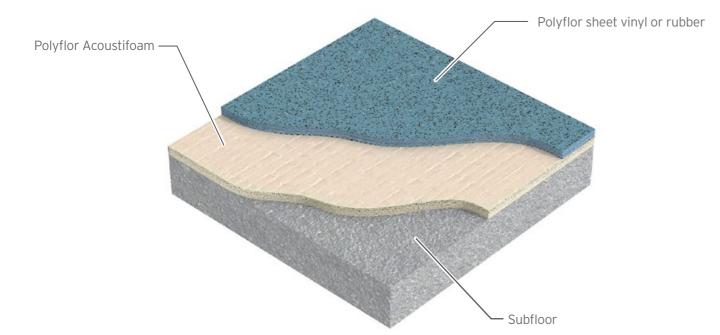


ACOUSTIFOAM



To further extend the choice of decoration and product type of acoustic floorcoverings, Polyflor offer Acoustifoam.

The product is a closed-cell foam backing sheet, incorporating glass-polyester reinforcement, which is simply installed beneath standard Polyflor vinyl and rubber sheet floorcoverings (with a minimum of 2mm gauge). When used in this underlay combination system, the gained advantages are to provide standard collections with the added acoustic properties, providing an **impact sound reduction level of at least 18dB**.





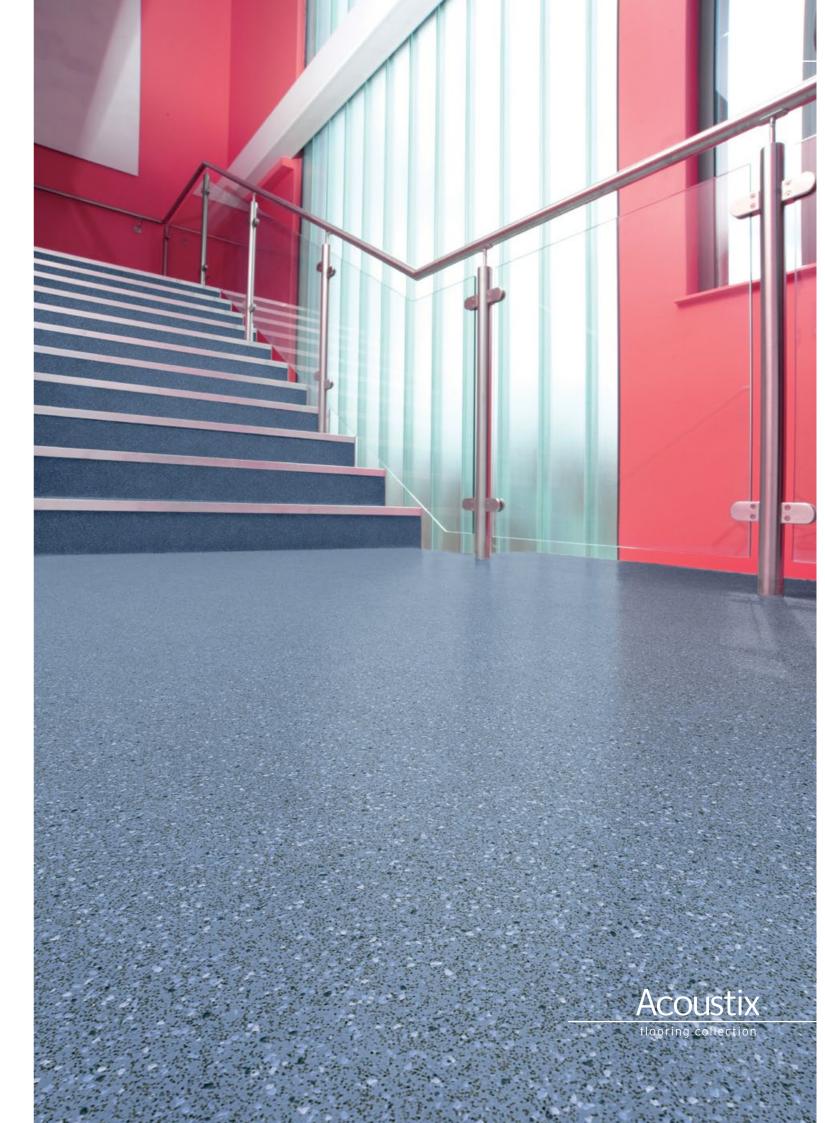
Polysafe Astral PUR: Space Mauve 4230, Starburst 4300, Solstice 4260



Classic Mystique PUR: Sunblaze 1260, Quartz 1400, Smokestone 1160



Polysafe Standard PUR: Arctic Blue 4130



OFFERING EVEN MORE CHOICE

Utilising Polyflor Acoustifoam allows for a broader choice of colours, styles and performance characteristics with an unrivalled total of **281 top-layer product options**².

Listed below are the Polyflor collections that are suitable for use with Acoustifoam. For specific product information and matching welding rods, visit the product pages at www.polyflor.com, view the relevant product brochure or contact the Polyflor Customer Technical Support Department.

Homogeneous sheet collections:

Polyflor Pearlazzo PUR

Polyflor Prestige PUR

Polyflor Mystique PUR

Polyflor Classic Mystique PUR

Polyflor 2000 PUR

Polyflor XL PU

Polyflor Standard XL

Heterogeneous sheet collection:

Polyflor Forest fx

Polyflor Mineral fx

Rubber sheet collection:

Saarfloor Diamant

Safety floor sheet collections:

Polysafe Corona PUR

Polysafe Astral PUR

Polysafe Mosaic PUR

Polysafe Wood fx PUR

Polysafe Vogue Ultra PUR

Polysafe Standard PUR

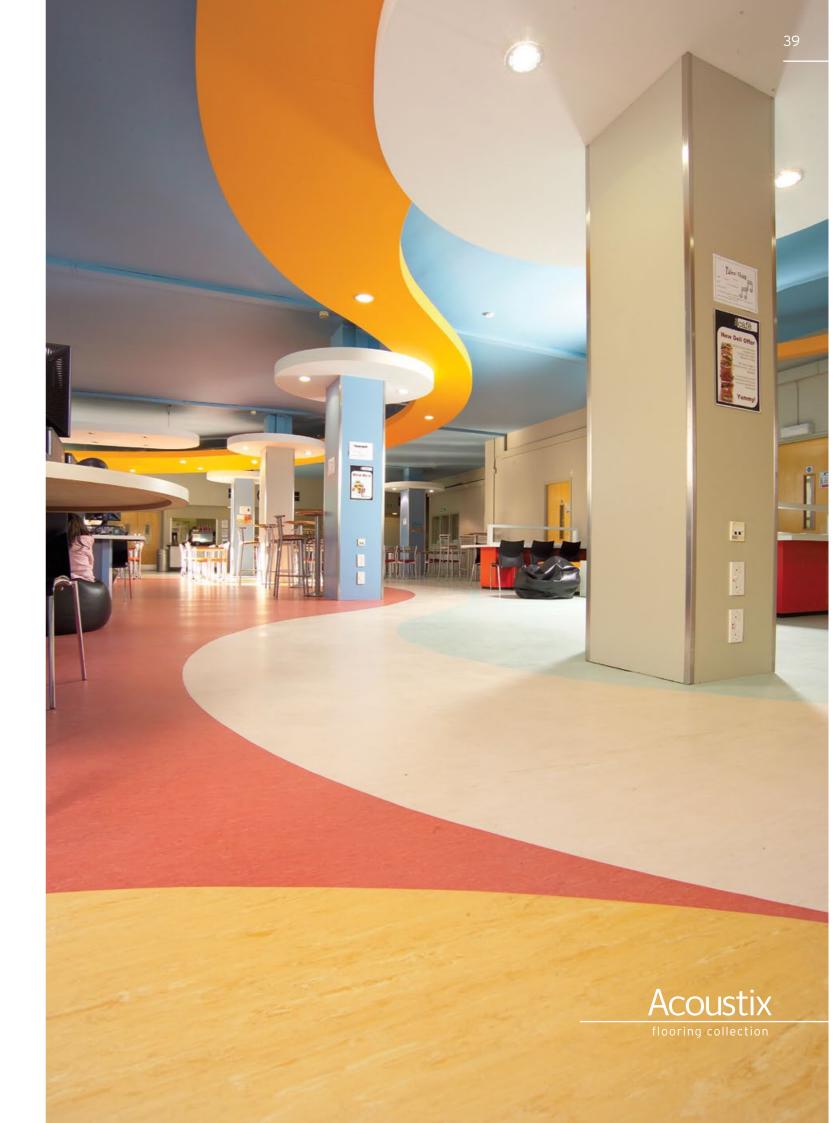
Polysafe Strata

Ecomax

Polysafe Modena PUR

Polysafe Arena PUR

Note: Polyflor vinyl tiles and planks, rubber tiles and ESD ranges should not be used in conjunction with Acoustifoam.



² Totals calculated to be correct at time of going to print

TECHNICAL INFORMATION

Installation

For full details on the installation of Acoustix Gallery fx, Acoustix Forest fx, Polysafe Wood fx Acoustix and Acoustifoam with recommended Polyflor products, including recommended adhesives, refer to one of the following contact points:

- Technical section of the Polyflor website www.polyflor.com
- Telephone the Polyflor Customer Technical Support Team +44 (0) 161 767 1111
- Email the Polyflor Customer Technical Support Team tech@polyflor.com

NB. Acoustifoam is not to be installed as a subfloor, isolating underlay or surface DPM.

Maintenance

Appearance, hygiene and cleanliness are key points to consider when establishing a maintenance programme. Poor maintenance can damage aesthetics, impairs performance, shortens floor life and creates hygiene problems in critical areas. In recognition of this Polyflor provides low maintenance options right across our product portfolio enabling the cleaning process to be as cost-effective and straightforward as possible.

The incorporation of a polyurethane reinforcement into the Polyflor Acoustix PUR collection helps protect the floorcoverings by resisting soiling and scuffing. Combined with the superior closed surface finish, this enhanced protection allows the use of a polish-free maintenance regime for the lifetime of the flooring. Fewer cleaning chemicals and greatly reduced power requirements mean reduced environmental impact.

CPD

To reflect today's demanding marketplace, Polyflor offer contractors and fitters a series of CPD training seminars, offering guidance and advise on a variety of topics including **vinyl floorcoverings**, **safety** and **acoustic floorcoverings**.

With an ever increasing array of vinyl floorings available in the market, each with different decorations, durability, performance characteristics and construction, Polyflor's CPD seminars aim to explain the many benefits contractors can achieve from using vinyl flooring, highlight environmental credentials and advise on traditional problem areas such as installation and maintenance and how to ensure that these are done correctly. After completion of the seminar, each attendee will receive a RIBA approved certificate.



42

Environment

Polyflor have demonstrated a high level of commitment over the years to producing high quality floorcovering, whilst minimising our impact on the environment without compromising the performance benefits of our products.

There can be few materials better suited to recycling than vinyl flooring. All Polyflor's acoustic floorcoverings are 100% recyclable, and can be recycled many times without loosing any of their performance properties. Polyflor continually works on developing new products and technologies, and constantly evaluates production methods to further minimise our impact on the environment.

Website

To view all of the Polyflor Acoustix ranges online, visit www.polyflor.com and follow the links to the Acoustic product pages. Here you will find product details, additional technical data and the option to view previous installations.

Samples

With regards to each design, it is only possible to give a provisional representation of the colour. To replicate the natural material, the wood effect products may contain knots or markings as part of their design. For colour selection, an original sample is recommended which we will be happy to supply.

To request individual product samples of any design within the Acoustix collection, visit www.polyflor.com and follow the link to Samples and Literature. Alternatively, call the dedicated Polyflor Samples Hotline on +44 (0) 161 767 2551.









TECHNICAL

43

		Forest fx	Wood fx Acoustix			
EN ISO 11638		Heterogeneous, PVC	-	-		
EN 13845		-	Heterogeneous, PVC	-		
		PUR	PUR	-		
EN ISO 10140-3	dB	≥19	≥19	2mm Polyflor Vinyl		
(EN ISO 140-8)				+ Acoustifoam ≥ 18		
EN 430	g/m²	2800	3000	680		
EN ISO 23997						
on EN 685		23, 34, 42	23, 34, 42	-		
EN 428	mm	3.7	3.7	2.0		
EN ISO 24346						
	mm	0.65	0.65	-		
		0.00	0.00			
	m	2 x 20	2 x 20	2 x 20		
		ZXZO	2 x 20	ZXZO		
		Class Rfl-S1	Class RfI-S1	Class BfI-S1		
		Class DII 31		Class 11		
		Class DC	CldSS I	CldSS I		
EN 13893			-	-		
51140045						
				-		
-			R10	-		
DIN 51130		R10	-	-		
S Rubber/Slider 96)		-	≥ 36	-		
Rz		-	>20µm	-		
EN 423		Excellent	Excellent	-		
(ASTM F 1301-99)						
EN ISO 11638		Class 1	Class 1	-		
EN 13845		-	50,000 cycles	-		
ISO 8302	m² K/W	0.0525	0.0525	-		
ISO 105-B02	level	≥6	≥6	-		
	mm	<02	<02	-		
			. 0.2			
	0/a	< 0.40	<0.40			
	70	٧٥.40	`0.40			
		Suitable	Suitable			
		Suitable	Suitable			
		Approved	Approved			
		• •	• •	-		
-		•	•	-		
F 100L2COL6		<u> </u>	,	-		
				-		
	, , ,	· · · · · · · · · · · · · · · · · · ·				
EN 1815 These products do not accumulate static charges above 2kV and are classified as 'antistatic'. For specialist						
	EN ISO 10140-3 (EN ISO 10140-8) EN 430 EN ISO 23997 On EN 685 EN 428 EN ISO 24346 EN 429 EN ISO 24340 EN 426 EN ISO 24341 EN 13501-1 ASTM E648 EN 13893 EN 13845 AS/NZ 4586 DIN 51130 S Rubber/Slider 96) Rz EN 423 (ASTM F 1301-99) EN ISO 11638 EN 13845 ISO 8302 ISO 105-B02 Method 3 EN 433 EN ISO 24343-1 EN 434 EN ISO 23999 EN 425 ISO 4918 door Air Comfort Gold AgBB FloorScore These products have MRSA on the floorin EN 1815 These pr applicatic	EN 13845 EN ISO 10140-3 dB (EN ISO 140-8) EN 430 g/m² EN ISO 23997 on EN 685 EN 428 mm EN ISO 24346 EN 429 mm EN ISO 243440 EN 426 m EN ISO 24341 EN 13501-1 ASTM E648 EN 13893 EN 13845 AS/NZ 4586 DIN 51130 S Rubber/Slider 96) Rz EN 423 (ASTM F 1301-99) EN ISO 11638 EN 13845 ISO 8302 m² K/W ISO 105-B02 level Method 3 EN 433 mm EN ISO 24343-1 EN 434 % EN ISO 23999 EN 425 ISO 4918 door Air Comfort Gold AgBB FloorScore These products have been independantly tested and MRSA on the flooring. An effective cleaning regime EN 1815 These products do not accumulate static applications where there is requirement to Polyflor Acoustix products achieve a BRE Global E areas such as education and healthcare. Polyflor acaptable areas such as education and healthcare.	EN 13845	EN 13845		







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