

# **KNAUF** DRYWALL



## **X-ray partitions**

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100% lead-free board

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Economical radiation protection

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Fire resistant

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Easy to install

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Excellent acoustic performance

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## **Knauf Safeboard**

**Lead-free X-ray shielding plasterboard**

***Build for the world we live in***



## Introduction

**Knauf Safeboard is an X-ray shielding plasterboard with a barium sulphate core. It effectively and significantly reduces the amount of lead needed within X-ray shielding partitions, in many cases removing the need for lead altogether.**

Knauf Safeboard brings X-ray protection together with fire and acoustic performance in one easy-to-install board. Knauf Safeboard is simple to install as it can be scored and snapped like a standard plasterboard. Knauf Safeboard Joint Filler is used to fill joints to complete the radiation shield.

The flexibility to redesign interior layouts and to build in changes of use to rooms is increasingly important when considering modern, future-adaptable healthcare projects. Knauf X-Ray Partitions can be inexpensively designed to suit mobile X-ray apparatus, and can be retro-fitted or removed far more easily than traditional lead-lined partitions.

**“I have found Knauf Safeboard to be a simple and space-saving solution to a number of radiation shielding situations”.**

Graham Hart,  
Radiation Protection Advisor,  
YourRPA

## Knauf Safeboard Properties

<b>Board Thickness</b>	12.5mm
<b>Board Width</b>	625mm
<b>Board Length</b>	2,400mm
<b>Board Weight</b>	17kg/m <sup>2</sup>

Manufactured to BS EN 520:2004 + A1:2009

Yellow dyed gypsum core with added barium sulphate

Knauf Safeboard can be curved to a minimum radius of 2750mm

## Knauf Safeboard Joint Filler Properties

Knauf Safeboard Joint Filler is a gypsum-based powder containing barium sulphate to provide radiation protection. Once mixed with water the jointing compound should be used for filling the joints between Knauf Safeboard and covering screw heads.

<b>Shelf Life</b>	6 months
<b>Coverage</b>	10m <sup>2</sup> per tub
<b>Tub Size</b>	5kg
<b>Colour</b>	Yellow

### KEY FACTS

Suitable for providing radiation protection in X-ray diagnostics and low power X-ray therapy areas

Fully tested by the Health Protection Agency

Cost effective

Lightweight, easy to cut, easy to install

Ideal for radiation protection in hospitals, dental practices, veterinary surgeries, research establishments, manufacturing and industry

100% lead-free

Speed of application

No need for additional lead fillets between joints

Stable pricing compared with lead





## How does it work?

### What's in it?

The special ingredient is barium sulphate, a radiocontrasting agent able to create a barrier for electromagnetic radiation of specific frequencies.

### How does it work?

As with a barium meal, where the X-rays hit the barium and the image shown gives a silhouette of the specific area of interest, Knauf Safeboard is filled with enough of this material to effectively block X-rays across its entire area.

### How consistent is it?

Due to significant investment in manufacturing techniques, every single square metre of Knauf Safeboard is tested thoroughly to ensure that the stated level of X-ray shielding will be achieved. There is no degradation of performance during the lifetime of the product, so you can be confident it will shield these potentially harmful rays first time and every time.

### How does it compare to traditional lead protection?

All material provides a degree of X-ray protection, this is termed 'lead equivalence'.

At 100 kV - 1.4mm of lead is equivalent to:

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112mm of reinforced concrete

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280mm of gypsum boards

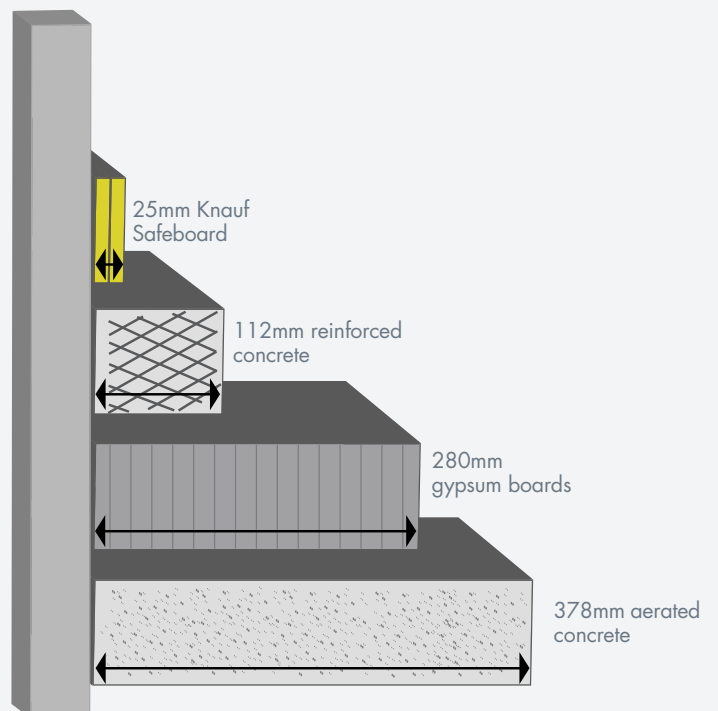
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378mm of aerated concrete

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25mm of Knauf Safeboard

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## How is it specified?

Understandably, shielding X-rays requires special consideration. Ensure that where necessary you engage a Radiation Protection Advisor. If it's a larger project, it's likely it will require an accompanying Radiation Protection Report.

The report gives a "lead code", which relates to the thickness of lead required. Where Knauf Safeboard differs to lead is that there are differing requirements based on the output of the X-ray source (measured in kV). The table below gives an indication of the number of layers of Knauf Safeboard required in a partition when compared to its lead equivalent.

### Step One

Receive a lead code and/or a lead thickness from the Radiation Protection Advisor (RPA).

Code 3	Code 4	Code 5	Code 6	Code 7
1.32mm	1.80mm	2.21mm	2.65mm	3.15mm

Note: Should you require protection not covered in the table above, please contact our Technical Services Department on 01795 416 259.

### Step Two

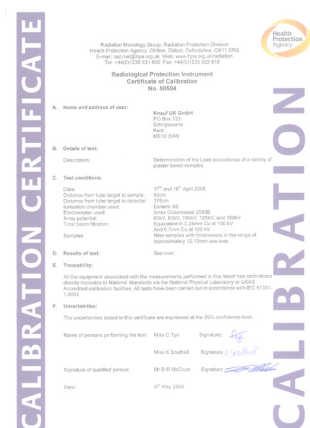
Identify the output of the X-ray source (in kV).

Note: The above information is required in order to specify Knauf Safeboard.

### Step Three

Cross-reference the lead thickness or lead code with the X-ray output to show the required number of layers of Safeboard layers in a partition.

60 kV	70 kV	80 kV	90 kV	100 kV	125 kV	150 kV	
0.45	0.60	0.75	0.70	0.70	0.50	0.40	1 layer
0.90	1.20	1.50	1.40	1.40	1.00	0.80	2 layers
1.35	1.80	2.20	2.10	2.10	1.50	1.10	3 layers
1.80	2.30	2.90	2.80	2.80	2.00	1.40	4 layers
-	-	-	-	3.40	2.40	1.70	5 layers
-	-	-	-	4.00	2.80	2.00	6 layers

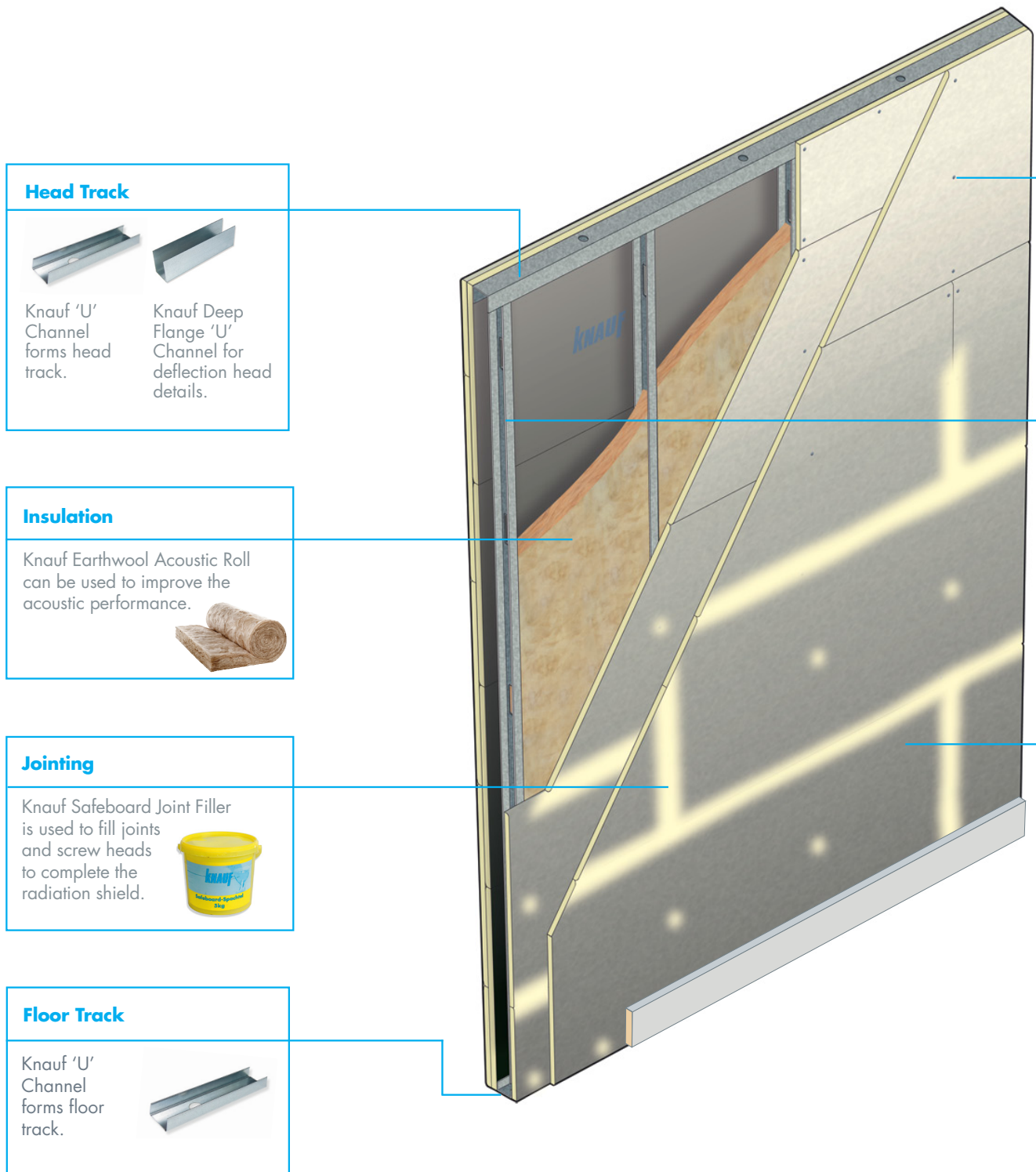


### Certification

To provide complete reassurance over its performance, Knauf Safeboard has been tested and approved for use by the Health Protection Agency.

## Knauf X-Ray Partitions

Knauf X-Ray Partitions incorporate the revolutionary Knauf Safeboard into a Knauf Performer partition system to provide protection from X-ray radiation without the need for lead. Our X-Ray Partitions are light, easy to install, and safe.



# Knauf Safeboard Performance Information

Partition Type	Sound	Fire*	Max Height**	Width
1 layer of 12.5mm Knauf Safeboard either side of 70mm Knauf 'C' Studs at 600mm centres with 25mm Knauf Earthwool Acoustic Roll within the cavity.	51dB(Rw)	30 mins	3600mm	97mm
2 layers of 12.5mm Knauf Safeboard either side of 70mm Knauf 'C' Studs at 600mm centres with 25mm Knauf Earthwool Acoustic Roll within the cavity.	59dB(Rw)	60 mins	4600mm	122mm

\* Fire rating quoted in accordance with BS 476: Part 22: 1987. For ratings in accordance with EN 1364-1: 1999, please contact Knauf Technical Services.

\*\* Maximum heights calculated based on a limiting deflection of L/240 at 200Pa.

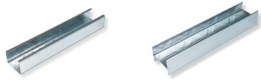
## Fixings

Knauf Drywall Screws are self tapping and self drilling and designed to work perfectly with Knauf Safeboard.



## Studs

Knauf metal studs simply twist and snap into head and floor tracks.



Knauf 'C' Stud lightweight steel section. Knauf 'I' Stud allows taller, stiffer partitions.

## Knauf Safeboard

Knauf Safeboard brings X-ray protection together with fire and acoustic performance in one easy-to-install board.



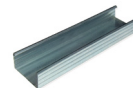
## Knauf Safeboard is also suitable for wall lining installations

### Head Track and Floor Track



Knauf 'U' Channel - Perimeter Support.

### Wall Lining Stud

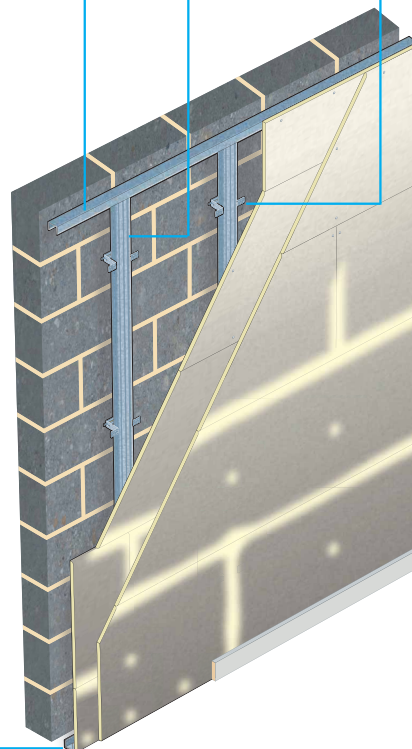


Knauf 'C' Channel.

### Brackets



Knauf Universal Bracket.



## Installation procedures

**Knauf X-Ray Partitions offer a safe, modern alternative to traditional techniques and reduce the need for specialist construction skills as they are installed in a similar way to traditional plasterboard partitions.**

### 1. Framework

For the best results, we recommend the use of lightweight metal Knauf 'C' or 'I' Studs. Studs should be positioned within the channels to coincide with the abutments of the boards and at centres dependant on the performance requirement, maximum of 600mm.

### 2. Cutting Knauf Safeboard

Knauf Safeboard is easily and accurately cut using a coarse bladed saw, or as you would with standard plasterboard simply score and snap. Score one side with a sharp knife, cutting through the paper. Snap the board along the score, and then cut through the paper on the other side. Smooth any rough areas caused by scoring with a rasp.

### 3. Fixing Knauf Safeboard

All boards are to be fixed horizontally. Knauf Safeboard should be screwed to the framework with Knauf Drywall Screws at maximum 300mm centres, reduced to 200mm centres at the corners.

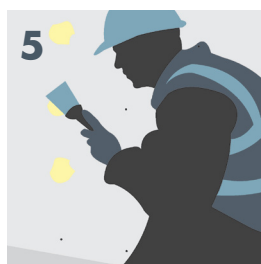
Ensure all vertical and horizontal board joints are staggered on each layer of a multi-layer system, and on each side of a partition. Vertical joints should be staggered by at least one stud spacing, and horizontal joints by half a board width.

### 4/5. Jointing

All joints, screw heads, and surface defects should be filled with Knauf Safeboard Joint Filler. If installing a multi-layer system the joints and screw heads on all layers should be filled. No tape is required for jointing Knauf Safeboard. Remove excess filler after 50 minutes in order to achieve a flat surface.

### 6. Finishing

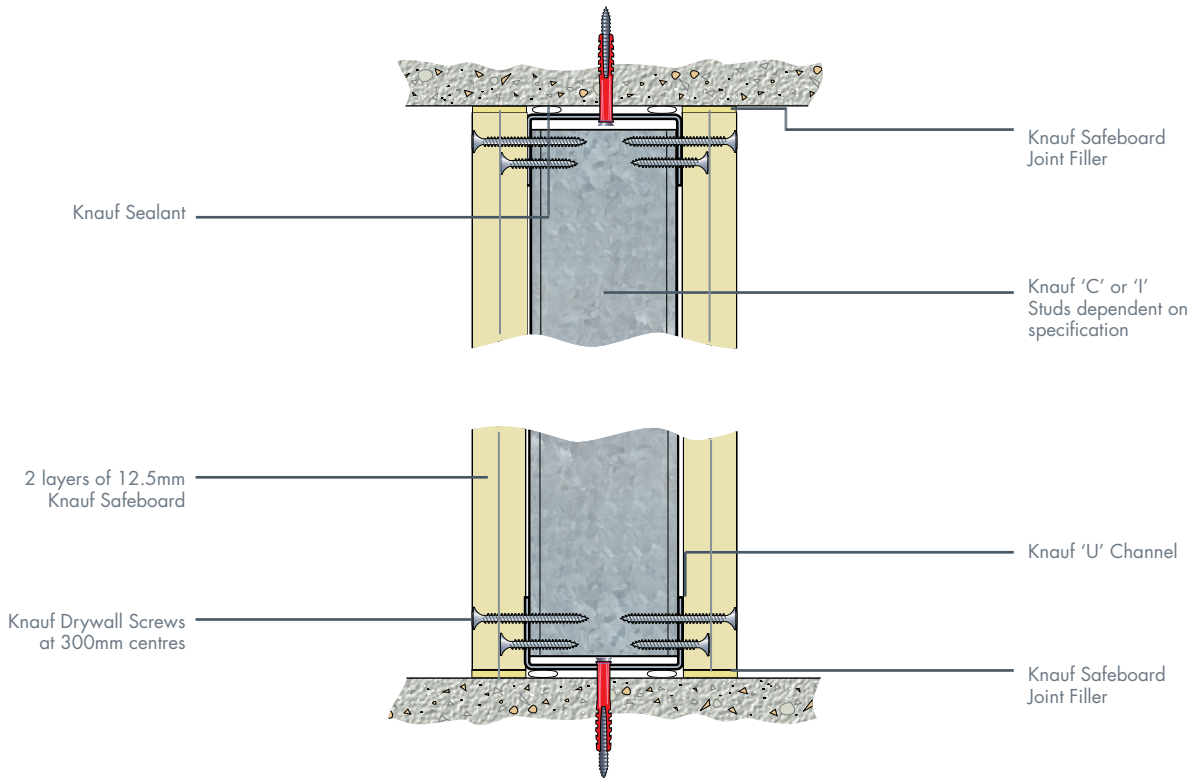
Once a flawless surface has been achieved Knauf Safeboard can be finished in the same way as any plasterboard. It can be skimmed with Knauf MPFinish or Knauf Universal Board Finish, or the joints can be overcoated and feathered out with Knauf Joint Cement Easy Sand or Knauf Joint Cement Lite Easy Sand, followed by a coat of Knauf Wallboard Primer prior to decoration.



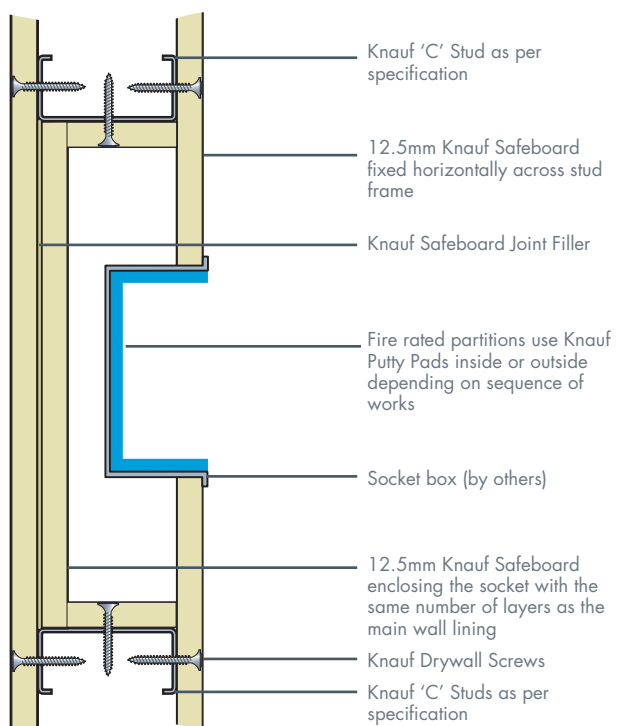


# Application Details

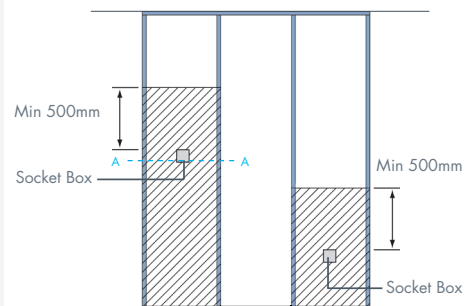
## Typical Knauf X-Ray Partition detail (4 layer system)



## Knauf Safeboard socket box detail (AA)



### Knauf Safeboard socket box elevation



Knauf Safeboard is installed within the cavity behind the socket box and should run from floor to a minimum of 500mm past the socket.



## Case Study: Peninsula Dental School, Plymouth

### Ease of installation made the case for using Knauf Safeboard in the X-ray rooms of the UK's first new dental hospital for 40 years.

#### Project Background

200m<sup>2</sup> of Knauf Safeboard was installed in the Peninsula Dental School at the Tamar Science Park, Plymouth – a partnership between the Universities of Exeter and Plymouth and the NHS in Devon and Cornwall that has put the South West at the forefront of delivering ground-breaking, modern clinical education.

#### Specifiers

Architects, Architects Design Group (ADG), needed a wall-lining product with equivalent lead protection from X-ray radiation from the intra-oral or Orthopantomogram (OPG) X-ray machines;

“Safeboard was clearly superior to the alternatives – a dense block construction that would take up a lot of space or lead-lined plasterboard, which would have required specialist skills and increased the number of trades needed on site. The system was vetted by the NHS radiology department who also witnessed installation at various stages and who have subsequently carried out on site testing.”

**Rich Smith, Project Architect  
Architects Design Group (ADG)**

The main contractor, Midas, were also keen to use Knauf Safeboard, as quantity surveyor Peter Philpotts explains:

“We wanted to let out the drylining contract as one package, which we couldn't have done if we had used the traditional leadlining method. We were also reassured by Knauf's guarantee and that it had been fully tested by the Health Protection Agency – that gave us peace of mind.”

**Peter Philpotts  
Midas**

## Project Data

#### Site

Peninsula Dental School, Plymouth

#### Architect

Architects Design Group (ADG)

#### Main Contractor

Midas



# **KNAUF** DRYWALL

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