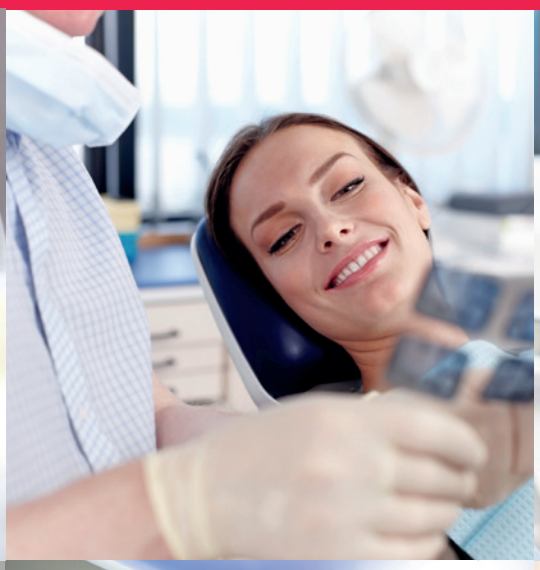
FITTING GUIDE
FOR SMALL PRACTICES

MidlandLead Healthcare



LEAD-LINED BOARDS

CONTENTS

NOTICE

This generic fitting guide has been developed by Coton Physics Services Ltd on behalf of Midland Lead. It should be noted that as a 'generic' guide it does not take into consideration specific situations and should not therefore be used without prior verification by a suitably qualified and authorised radiation protection advisor.

No liability is accepted by Midland Lead Limited, Coton Physics Services Limited or their employees for any errors or omissions in this document, or in the data used for its preparation.

HOW TO USE THIS GUIDE

This is a generic guide for the fitting of lead-lined boards produced by Midland Lead which have been designed and manufactured to comply with specific requirements for use in radiation protection applications.

This guide gives advice on the installation of plain lead sheet, laminated lead plywood and lead plasterboard within small healthcare practices. It details the application of the material to a plain wall and gives information on corners between walls and junctions with floors, ceilings, door frames and electrical fittings.

The guide assumes absolute continuity of protection is required. Secondary protection has therefore been outlined in areas where the fixing screws penetrate the lead. If this level of protection is not required then certain additional protective measures may be omitted subject to approval by your radiation protection advisor (RPA). Please note that this is an advisory guide only and does not apply to radiotherapy installations. Your appointed RPA must be consulted for final advice prior to installation of any radiation protection and will specify the correct thickness of lead which is required for your facility.

Your RPA should inspect the installation as it progresses or you should provide them with adequate photographic evidence of the correct installation. The fitted lead content should be stated on a label applied to the protected surface after completion.

MIDLAND LEAD

Midland Lead is a specialist manufacturer of lead sheet, lead-lined boards and other lead-related products for use in radiation protection within healthcare. We have been manufacturing lead products for more than 30 years at our UK manufacturing facilities based in Derbyshire. We are the only UK lead manufacturer to work with cast, rolled and sandcast lead supplying products to the construction, heritage and healthcare sectors.

Our expertise in the manufacture of lead combined with our knowledge of shielding technology means our customers are assured that our products consistently meet the highest standards of quality and safety required in radiation protection.

OUR HEALTHCARE PRODUCTS

Midland Lead offers the widest range of lead-lined boards in the UK. Lead-lined boards are used in hospitals, clinics and small practices to give complete protection against harmful levels of radiation. In addition to lead-lined boards we also supply the following range of lead products:

- Lead-lined door sets
- Lead glass
- Lead portable shields
- Lead aprons
- Lead glasses

LEAD-LINED BOARDS

All our lead-lined boards are custom-made to size at our UK manufacturing site using either machine cast or rolled lead. Depending on the application, boards can be lined with lead sheet in varying thicknesses, ranging from Code 1 (0.45mm) through to Code 8 (3.55mm), with the choice of varying thicknesses in between. In the UK we usually recommend Code 3 (1.32mm) for use in small practices, however, exact specification should always be made in consultation with a radiation protection advisor.

In most cases our boards are manufactured using plasterboard/gypsum, however MDF or plywood can also be requested. Encapsulation and laminating finishing options are also available for use in healthcare practices.

WHY USE LEAD?

Reliable protection

Lead is widely regarded as the most reliable barrier against all forms of radiation. Not only is it an exceptionally dense substance, this density is uniform, preventing the penetration of electromagnetic energy. This ensures the protection of healthcare professionals and patients at all times.

Space saving

The great advantage of lead is that, although a very dense material, the protection it provides is attainable at minimal thickness. This means that radiation protection using lead-lined boards takes up very little room, particularly when compared to many alternatives.

Sound barrier

Lead is also an outstanding barrier again noise. Lead-lined boards prevent bleed through of noise both internally and externally.

Cost effective

The competitive cost of lead sheet combined with the protective qualities and minimal space requirements makes lead the preferred option for healthcare practices.

PRACTICAL TIPS

Specification of boards

Lead sheet can be bonded to various types of boards, and we don't suggest that one type of board is better than another. In most cases we use plasterboard/gypsum but other types of board are also available, including MDF and plywood. For shielding in excess of 3.00mm thick we recommend the use of plywood panels instead of gypsum board.

Our plasterboard/gypsum boards are usually sized 2.4m x 600mm x12.5 mm but we can supply boards up to a maximum of 3.0m. Plywood and MDF boards are available in thicknesses from 4mm to 25mm.

If you're choosing gypsum, please note that although gypsum boards are available up to 1200mm width, boards get prohibitively heavy and difficult to handle above our standard width of 600mm. They may also be more prone to breakages.

Make sure you apply the correct thickness of lead to your facility. Code 3 is usually recommended for small practices, however the exact thickness must be specified by your radiation protection advisor. They will also specify what areas of the surgery walls will require shielding and if you need to shield your room to full ceiling height.

As all our lead-lined boards are made to order it is imperative that you order the correct materials in sufficient quantities or this could delay work. Because our panels are made to order we are also able to cut panels to the exact sizes required which will reduce the amount of work on site and enable a quicker fit-out.

Handling and storage tips

Lead is not covered by COSHH (Control of Substances Hazardous to Health), and handling lead is perfectly safe – but we do recommend you take certain precautions:

- Wear protective gloves when handling the lead sheet.
- Even though you've been wearing gloves, wash your hands thoroughly as soon as possible after you've finished.
- Don't eat, drink or smoke until you've washed your hands.
- Ensure you have help to lift the lead into position.

Fitting tips on weight

Before you can fit lead-lined boards to any wall or ceiling, you need to calculate the weight of the bonded panels.

Use our weight chart to find the weight (in kg) of our lead-lined boards per square metre.

LEAD-LINED BOARD WEIGHT FITTING GUIDE		
Lead Thickness	12.5mm plasterboard	12mm hardwood plywood
CODE 3 (1.32MM)	23kg	32kg
CODE 4 (1.80MM)	29kg	37.5kg
CODE 5 (2.24MM)	34kg	42.5kg
CODE 6 (2.65MM)	39kg	47.5kg
CODE 7 (3.15MM)	44kg	52.5kg
CODE 8 (3.55MM)	49kg	57kg

Fixing tips for ceilings and floors

Because it offers greater structural strength than plasterboard, we recommend you use lead bonded to plywood for use on ceilings and floors.

You will also need to consider the panel weight - try to limit it to 25kg for ceilings and 60kg for floors if possible. Half size plywood and gypsum panels are available for this application.

Fillet backing strips

Fillet backing strips are normal rolls or strips of lead that are fitted to the wooden battens or steel framework where the lead boards are joined together. They are normally 50mm wide and are supplied in the length and lead code of the lead-lined board.

We also supply corner strips which again are rolls of lead 100mm wide in the length and code of lead board shield.

IMPORTANT:

BEFORE COMMENCING ANY WORK, CHECK THE JOB SPECIFICATION WITH YOUR RADIATION PROTECTION ADVISOR.

DURING CONSTRUCTION REMEMBER TO DOCUMENT AND PHOTOGRAPH THE WORK BEING CARRIED OUT, ESPECIALLY THE HIDDEN LEAD SHIELDING.

FITTING
PLAIN LEAD SHEET

When using plain lead sheet as protection, each lead sheet MUST overlap its neighbour by a minimum of 25mm (1).

The lead sheets should be nailed to battens affixed horizontally to the wall using large headed nails. Start with the bottom sheet and work horizontally ensuring each sheet overlaps its neighbour by 25mm (2). See instruction on next page with regard to corners.

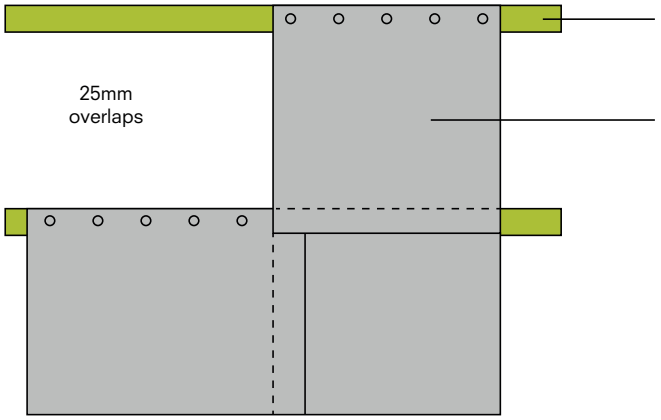
Next work upwards applying lead sheets to the next strip of horizontal battens ensuring the nail heads from the sheet below are covered by the new lead sheet (3 & 4).

Vertical supports for the top board should then be screwed through the lead into the battens. Screw heads must be covered with 50mm square lead plates (3 and 4).

Key

Lead · Facing boards · Battens/supports · Wall

1.



Front view

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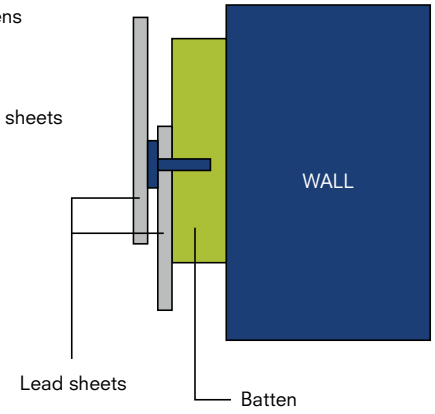
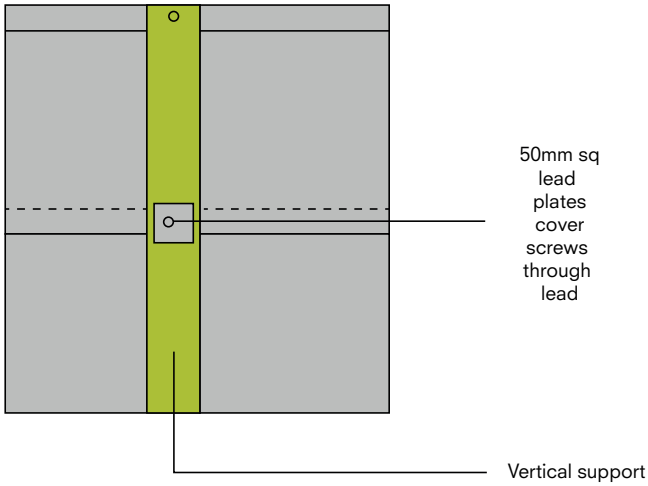


Side view

3.



Front view

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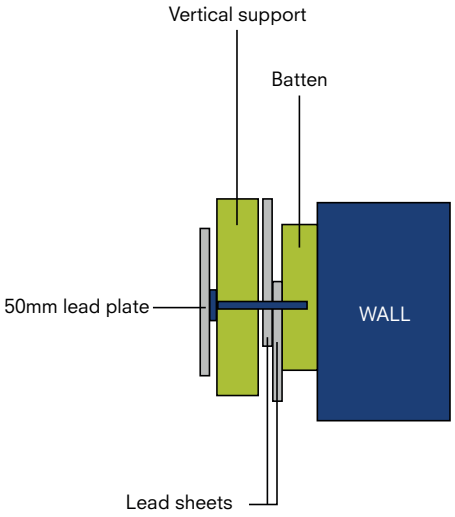

Side view

FITTING
PLAIN LEAD SHEET

Next apply the facing board **ensuring that the fixing screws do not penetrate any lead sheet beneath them** (5 and 6).

A note on corners: When reaching the corners of walls, lead should be overlapped by at least 100mm. This also applies to floors and ceilings (7).

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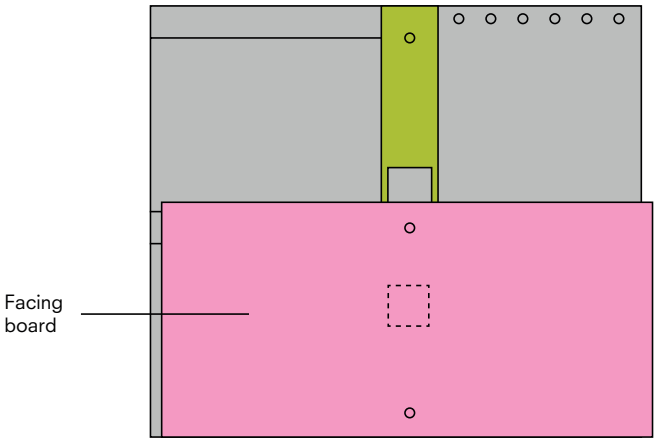
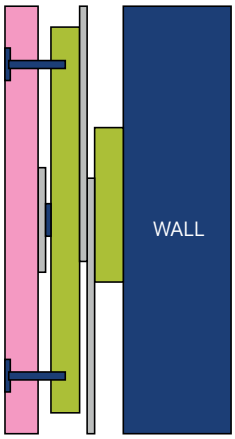


Front view

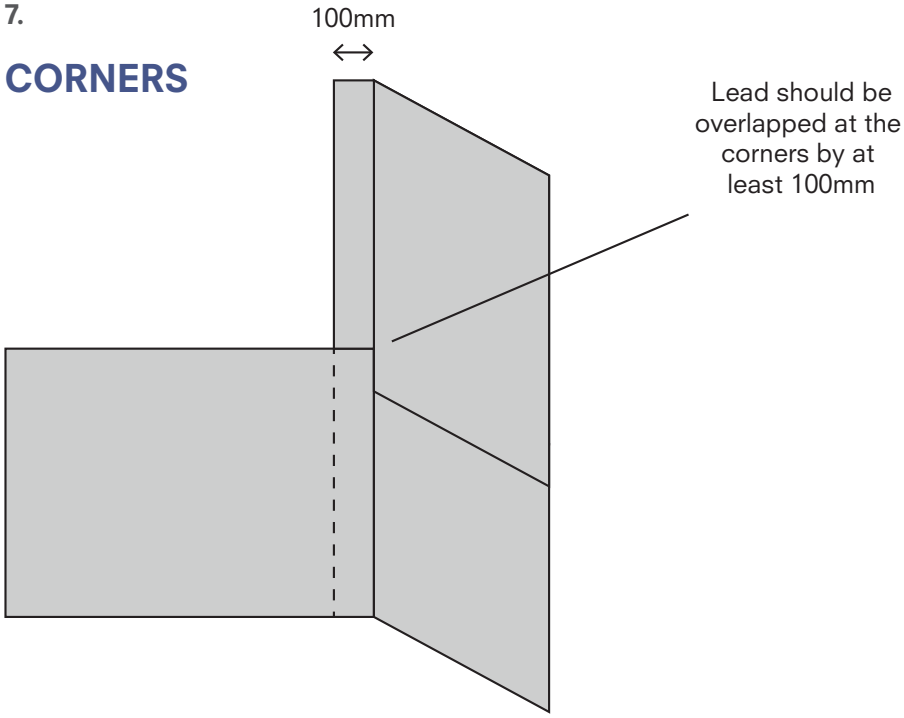
6.



Side view

7.

CORNERS



FITTING
LEAD FACED PANELS

When using lead faced panels as protection, lead in the form of **lead strips must be used to ensure the panels overlaps its neighbour by at least 25mm on two adjacent edges** (1 and 2). This must be specified to the suppliers.

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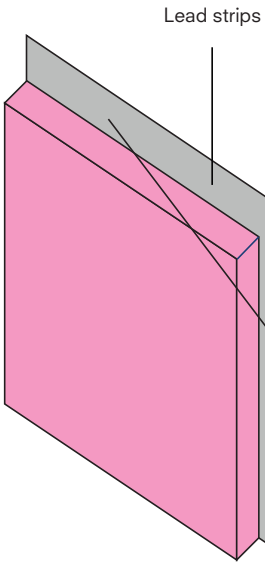

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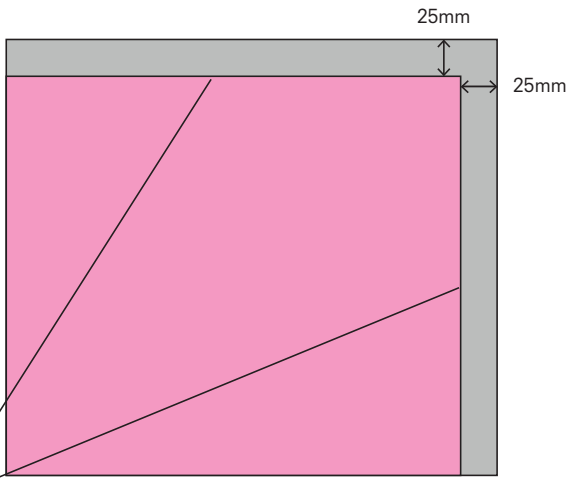


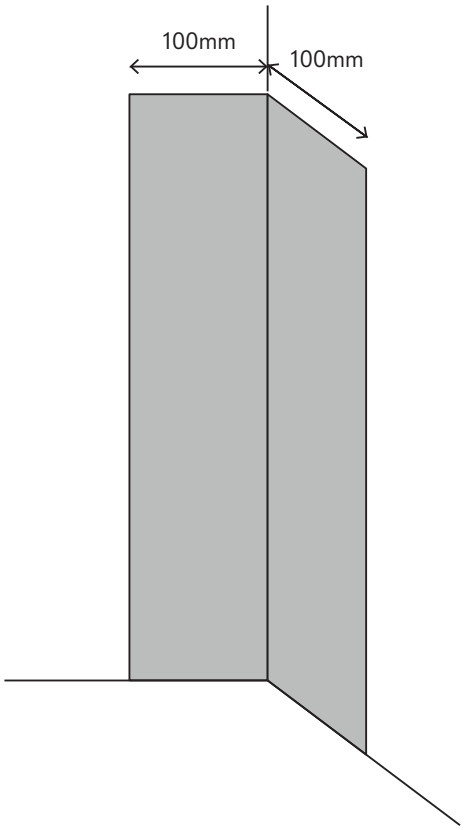
Front view

FITTING
LEAD FACED PANELS

Start with the corners of the room first, applying lead sheet which should be folded into the corner to a minimum width of 100mm on each side (3).

Next affix battens to the wall on top of the lead sheet (4).

3.



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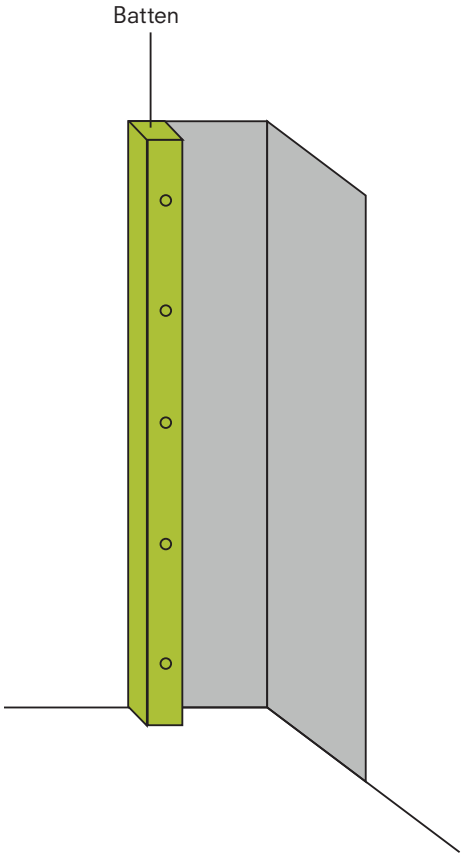
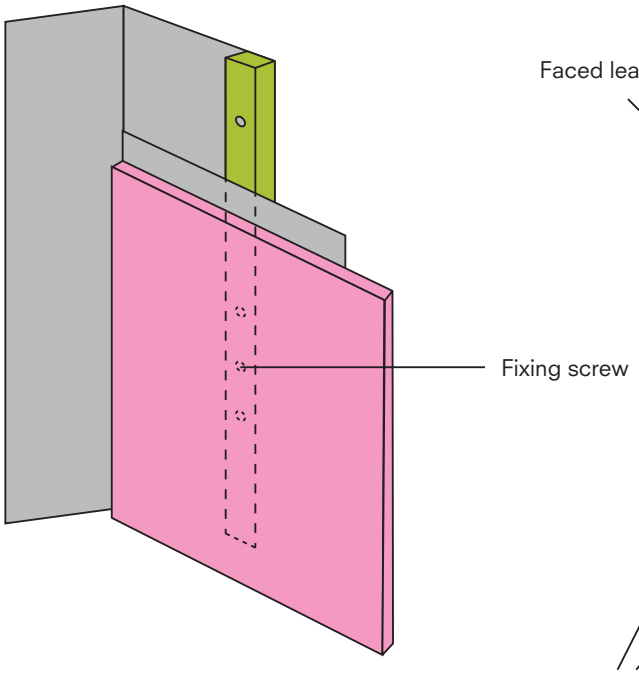


FITTING
LEAD FACED PANELS

Starting with the lowest point, lead panels should then be fixed to the battens using fixing screws (5 and 6).

The fixing screws should be positioned MIDWAY between the batten fixing screws. Care must be taken not to penetrate the lead sheet lining on the wall (6).

5.



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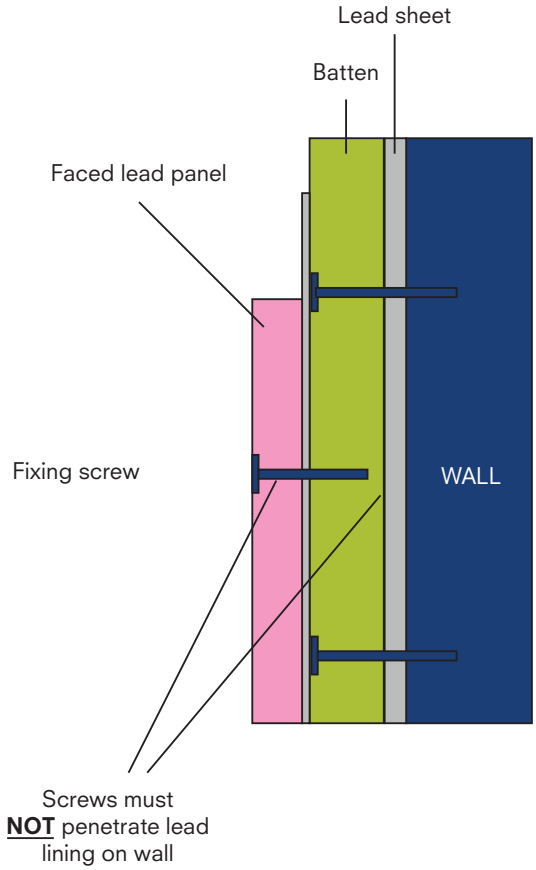
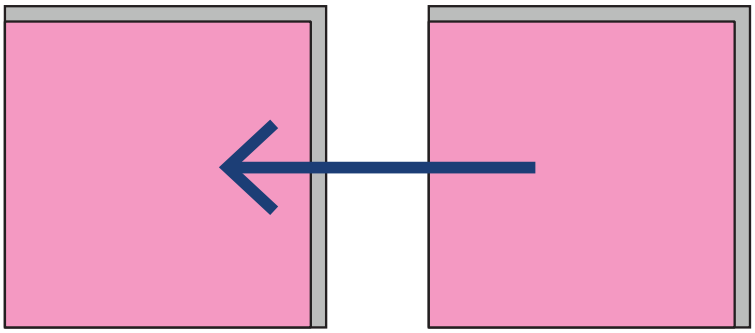


FITTING
LEAD FACED PANELS

Continue to fix the lead panels horizontally with the lead strips overlapping the adjacent panel by at least 25mm (7, 8 ,9 and 10).

When the whole wall is covered there will be an extra thickness of lead at the point where the two panels overlap. This will be equivalent to the thickness of lead protection required.

7.



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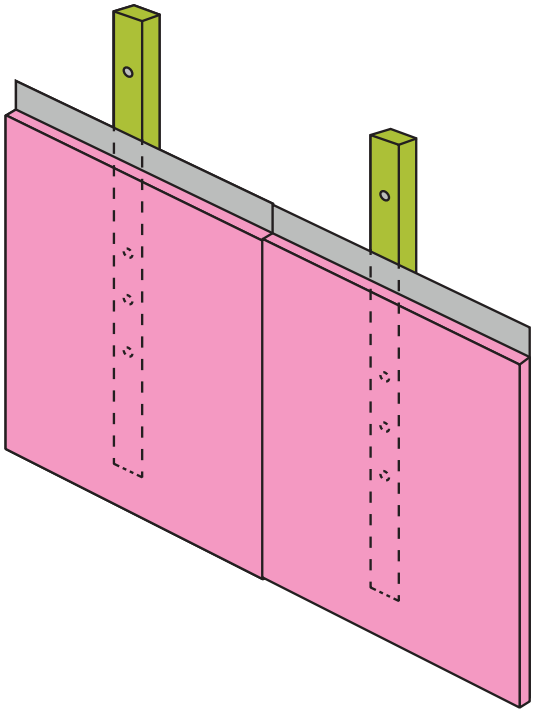

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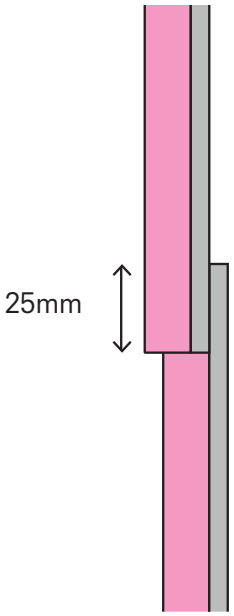

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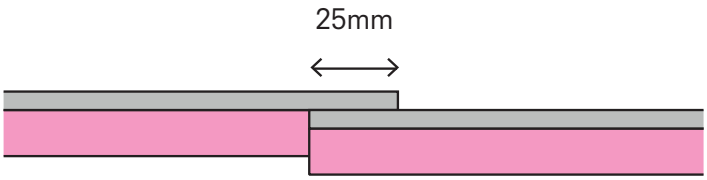
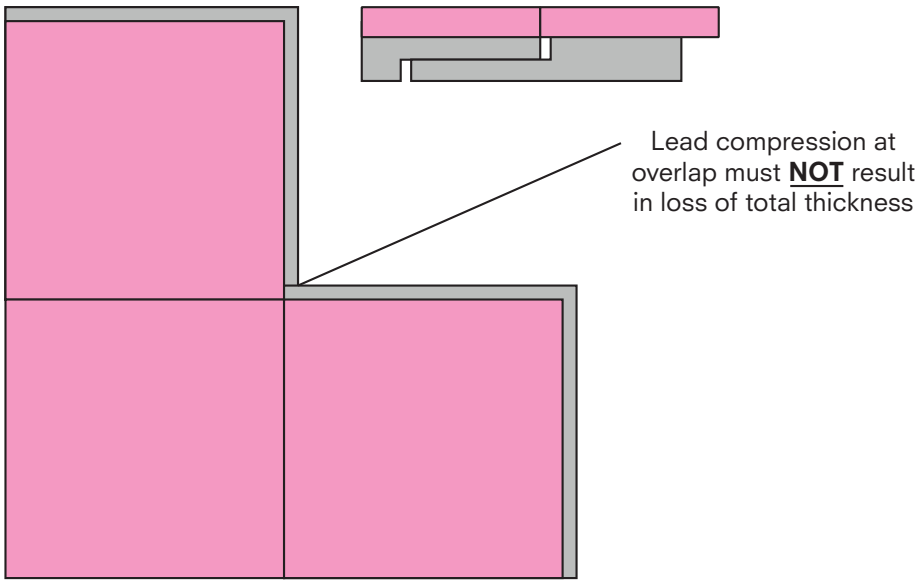


FITTING
LEAD FACED PANELS

When there is a single overlap at the board edges this should not present a problem, however where four panels meet excessive thickness differences could occur. This will not be greater than 2x the protective lead thickness. Lead thickness at this point could be reduced on each board by compression if desired, provided that the total remaining thickness of lead is no less than that specified (11).

11.



FITTING
PLAIN SHEET LEAD TO DOOR FRAMES

Door frames may also need to have lead installed.

In these instances the lead in the wall must be continuous with the lead in the door frame. This is easily achieved by overlapping. The lead in the door must also be overlapped by the lead in the frame.

An additional 100-200mm wide strip of lead is also recommended on the wall outside of the room to avoid 'line of sight' gaps in the shielding.

When using PLAIN SHEET LEAD continue the lead over the lead in the frame or you can make up the frame lead at the same time.

A small amount of lead should be visible at the edge after covering with architrave. Large areas of lead must always be covered or painted since lead can be toxic when in contact with skin.

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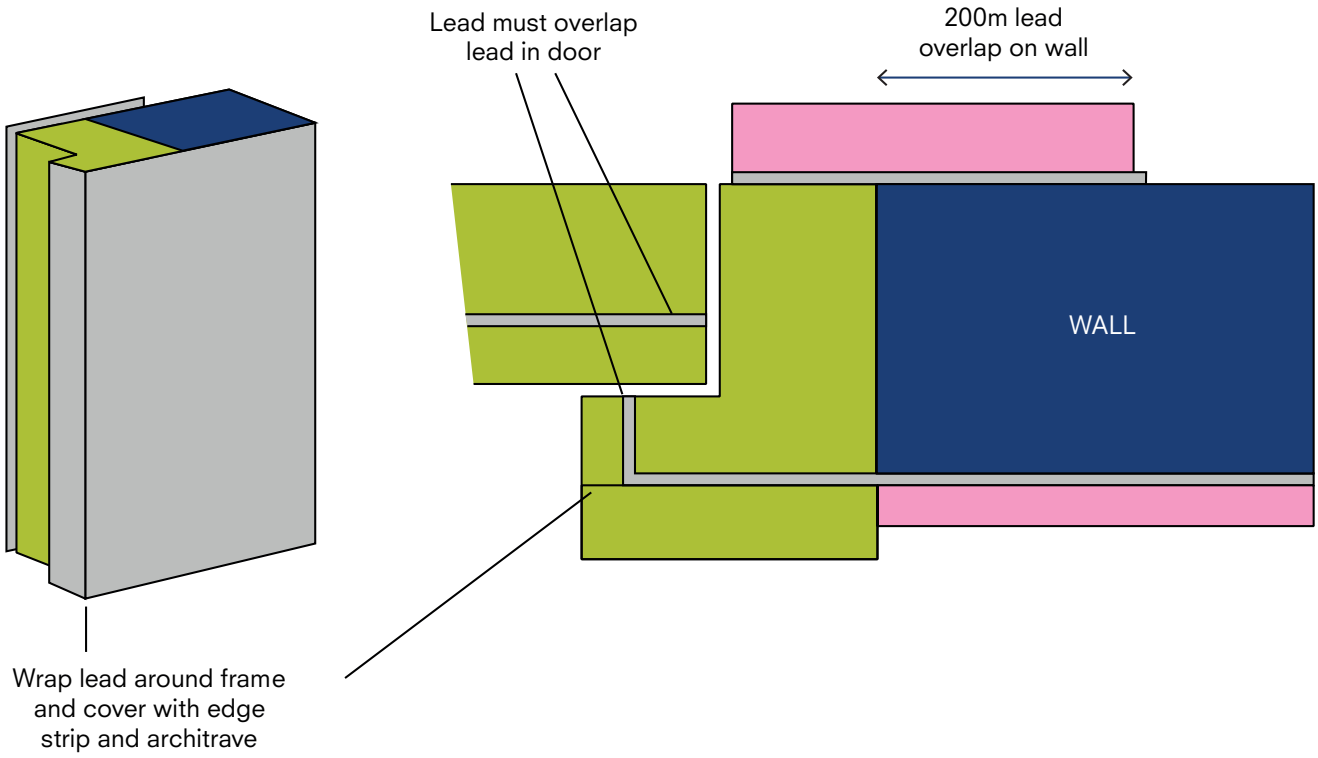

FITTING
LEAD PLASTERBOARD/PLYWOOD TO DOOR FRAMES

When using LEAD PLASTERBOARD/PLYWOOD apply a 100mm lead to overlap the lead in the frame or make up the frame lead at the same time.

A small amount of lead should be visible at the edges after covering with architrave. Large areas of lead must always be covered or painted since lead is toxic to the skin.

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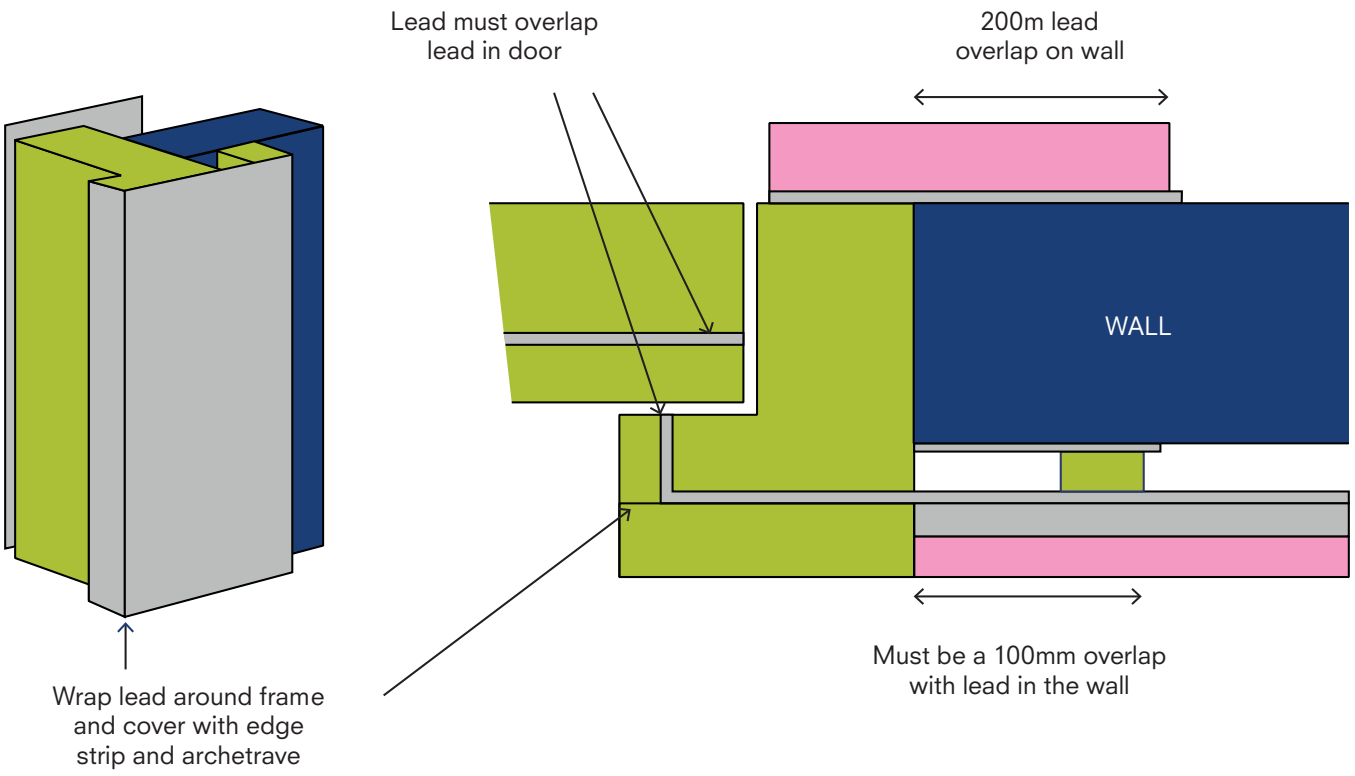

FITTING
PLAIN SHEET LEAD TO ELECTRICAL FITTINGS

It is recommended that electrical fittings are surface mounted. Care must be taken not to damage the lead surface by screws during the fitting (1 and 2).

If using electrical boxes additional lead protection must be added to prevent loss of continuity in the radiation protection. The simplest solution is to install the wall boxes first. To ensure protection the lining lead sheet should extend a minimum of 300mm above the top and sideways of the box assuming that is where the conduit holes are located (3).

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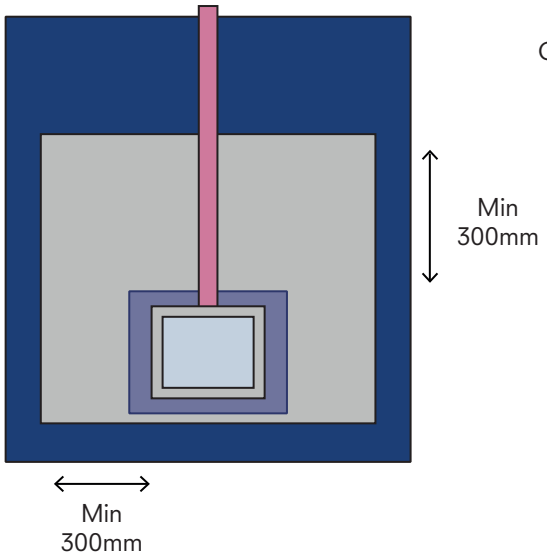

Front view

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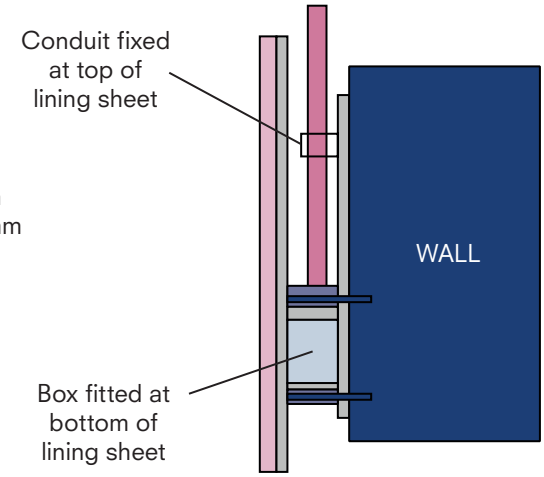

Side view

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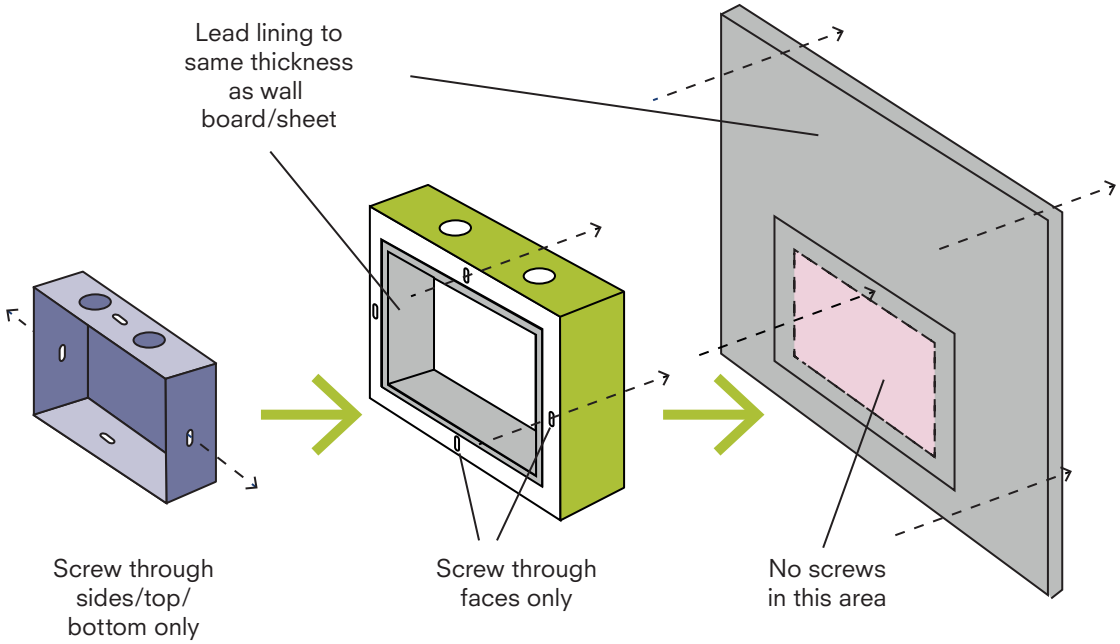

FURTHER ADVICE

This installation guide together with your final plans, should be sent to your appointed radiation protection advisor for approval before any work commences.

A site visit should be arranged during installation of the protection by the RPA at the stage just prior to the addition of top surfaces.

The guide is provided without any knowledge of the room in which the protection is to be added.

If you have any queries or require further technical advice, please do not hesitate to contact Midland Lead on 01283 224555.

MidlandLead
Healthcare

MidlandLead

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