	Radiology statement MDCR Pb1-Pb4 (Lead 1mm - 4mm)	Procedure number- MDE-SE-PR-1023	Revision date -	Process Owner: Operations office Manager: R. Homan	
			Revision number 02	Author: Release date:	A. Anagol 17/04/2025

Radiology statement Medicare Pb1 – Pb4

Introduction

Metaflex Doors Europe offers a range of doors for radiation shielding. Medicare is a medical door with airtight/hermetic feature.

The door system comprising of the door body, wall frames and windows provides the specified protection against radiation when these components are used in combination (without exclusions) and in closed position of the door.

Conditions

Since there are no international standardized regulations regarding the measurement of radiation protection, the sources type, distance of measurement etc. It is difficult to cater to and take into consideration the different regulatory norms.

Therefore, to determine the correct lead application and the thickness of lead used, Metaflex doors work in the following conditions:

1. The source of the radiation (primary source) is Static and located at least one (1) meter away from the front of the door and one (1) meter above the floor (centered to the door).
2. The radiation must reach the door below ($\pm 45^\circ$ from the horizontal) (see figure1).
3. The wall will not be supplied by Metaflex and is the buyer's full responsibility. The wall must be radiation proof and should have a lead overlap with the Metaflex wall-frames. Type of radiation used: X-rays.
4. The standard keV radiation shielding of the window offered at the Metaflex Doors Europe B.V. is 110 KeV.
5. All Metaflex doors use lead as radiation protection material, this is according to the lead alloy grade PB810M (EN 12588:2006).

All Metaflex doors will be delivered in accordance with the Metaflex General Terms and Conditions of Delivery and Payment, as applicable to the agreement between Metaflex and the buyer.

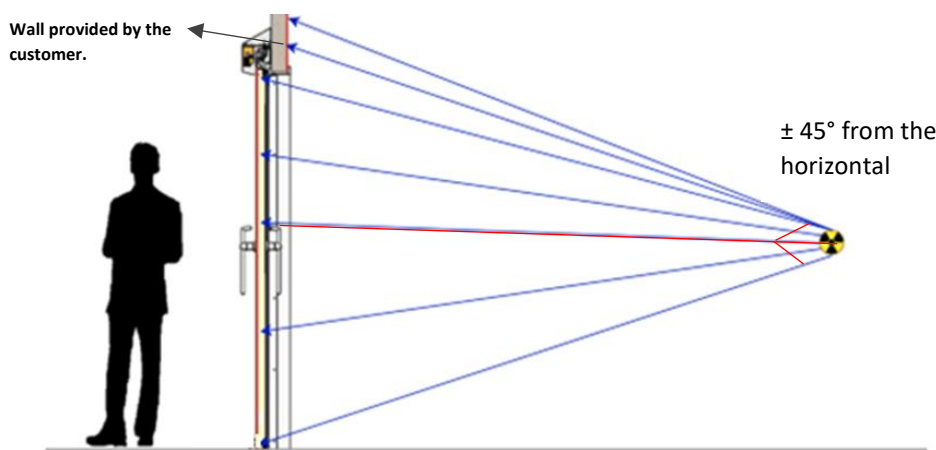



Figure 1 A Metaflex Medicare door providing radiation protection.

The figure 1 shows how the Medicare door system provides protection against radiation in an enclosure which has a source of radiation for radiological application.

Note: For further information about the door, windows and wall frames refer to the technical drawings and for any other thickness of lead other than the standards, and other door related queries please contact the sales team.

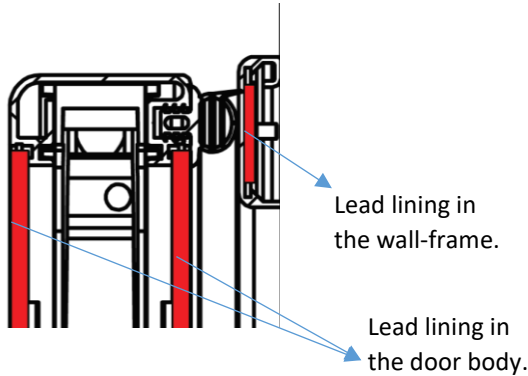
	Radiology statement MDCR Pb1-Pb4 (Lead 1mm - 4mm)	Procedure number- MDE-SE-PR-1023	Revision date -	Process Owner: Operations office Manager: R. Homan	
			Revision number 02	Author: Release date:	A. Anagol 17/04/2025

Medicare Door system

The Medicare door is offered in four standard lead configurations.

The tables (1 & 2) illustrate the various thicknesses of lead available as standard lead options for the door body and the window and figure 2, 2a & 3 shows the location of the lead in the door and the window.

A standard Medicare door body and window.



Door type	Wall frame	Side overlap in mm	Min side overlap in mm	Overlap top in mm
Medicare	Malmö	36	13	14.5
Medicare	Helsinki	36	13	14.5
Medicare	Halmstad	36	13	14.5
Medicare	Vario	36	13	14.5
Medicare	Oslo	36	13	14.5
Medicare	Mounting frame	36	13	14.5
Medicare	1 side alu	36	13	14.5
Medicare	1 side stainless steel	36	13	14.5

Table 1 Overlap distances for Medicare.

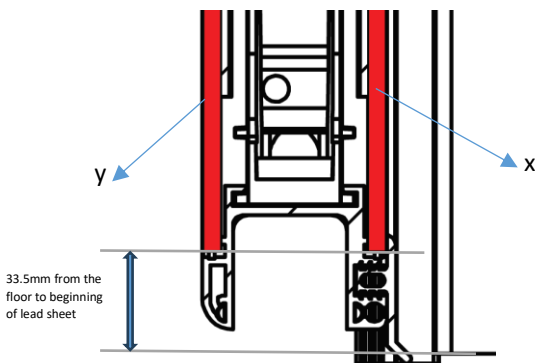


Figure 2 Side view cross section of a Medicare.

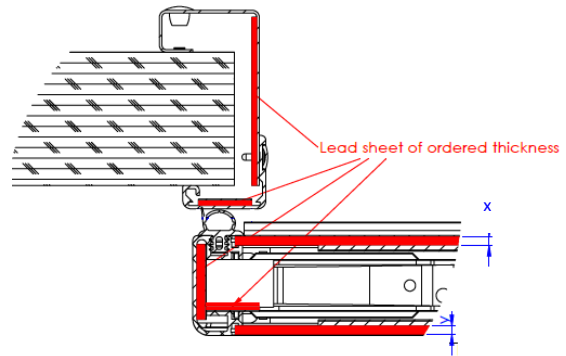


Figure 2a Top view cross section of a Medicare with Halmstad wall frame.

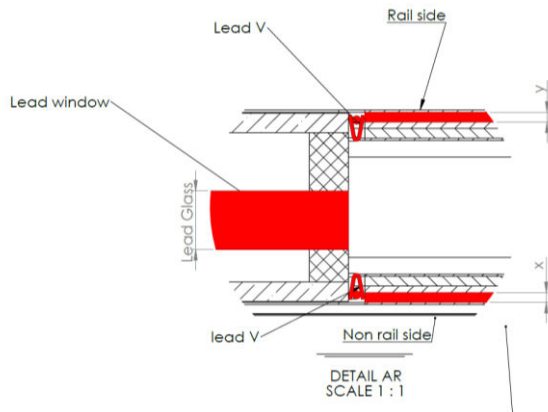



Figure 3 Window Lead thickness configuration

Door type	x in mm	y in mm	Lead glass in mm	Openers
L1	1	0	≥ 1mm	No leakage during tests with X-rays upto 3mm lead
L2	1	1	≥ 2mm	
L3	2	1	≥ 3mm	
L4	2	2	≥ 4mm	No Data

Table 2 Lead thickness configuration

Note: For further information about the door, windows and wall frames refer to the technical drawings and for any other thickness of lead other than the standards, and other door related queries please contact the sales team.

	Radiology statement MDCR Pb1-Pb4 (Lead 1mm - 4mm)	Procedure number- MDE-SE-PR-1023	Revision date -	Process Owner: Operations office Manager: R. Homan	
			Revision number 02	Author: Release date:	A. Anagol 17/04/2025

Corners of the door.

Due to the corner brackets that are used to assemble the door, the corner has lesser overlap of lead in the door and in the wall frames. As shown in the images below, the corner brackets at the corner of the door where the lead overlap between the door body and the wall frame is slightly reduced than other regions of the door body.

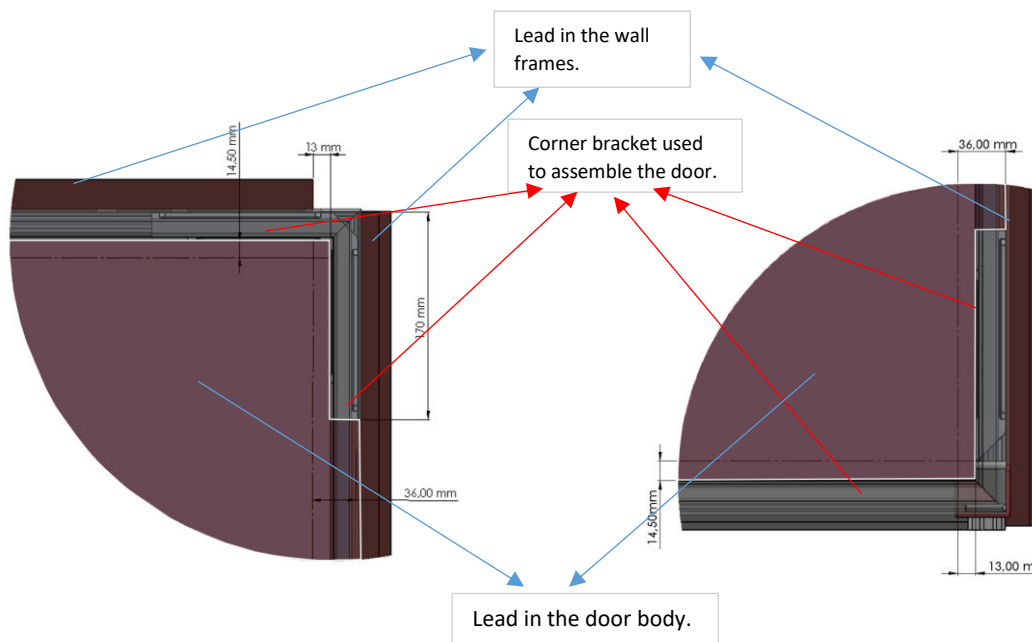


Figure 4. lead shielding at the corners of the door body.

Openers

Hermetic opener

When hermetic opener configuration is used as openers, the door body must be drilled to fasten the hermetic opener on the door body with screws. This will cause to drilling on the lead sheets. However, during measurements, the hermetic opener, the screws, and the nuts on the door body will provide radiation shielding equivalent to lead in the door body (in case of X-rays and 3mm lead door).

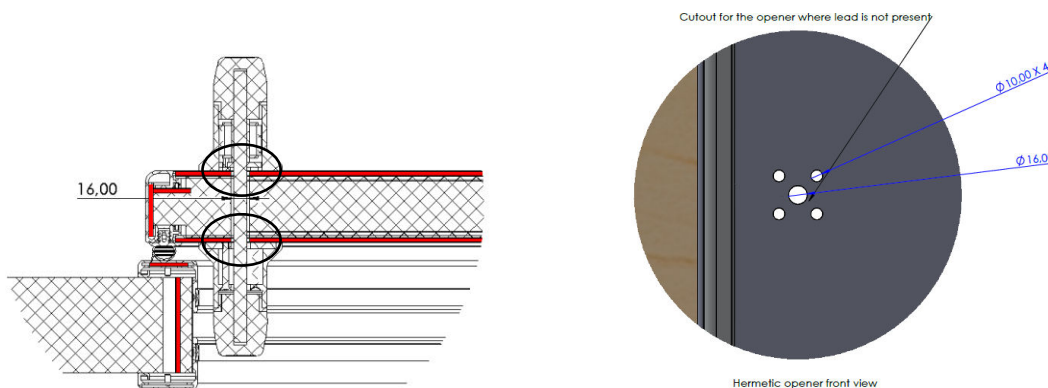



Figure 5. lead shielding at Hermetic opener.

Note: For further information about the door, windows and wall frames refer to the technical drawings and for any other thickness of lead other than the standards, and other door related queries please contact the sales team.

	Radiology statement MDCR Pb1-Pb4 (Lead 1mm - 4mm)	Procedure number- MDE-SE-PR-1023	Revision date -	Process Owner: Operations office Manager: R. Homan	
			Revision number 02	Author: Release date:	A. Anagol 17/04/2025

D-handle Opener

When D-handle opener configuration is used as openers, the door body must be drilled to fasten the D-handle opener on the door body with screws. This will cause to drilling on the lead sheets. However, during measurements, the D-handle, the screws, and the nuts on the door body will provide radiation shielding equivalent to lead in the door body (in case of X-rays and 3mm lead doors).

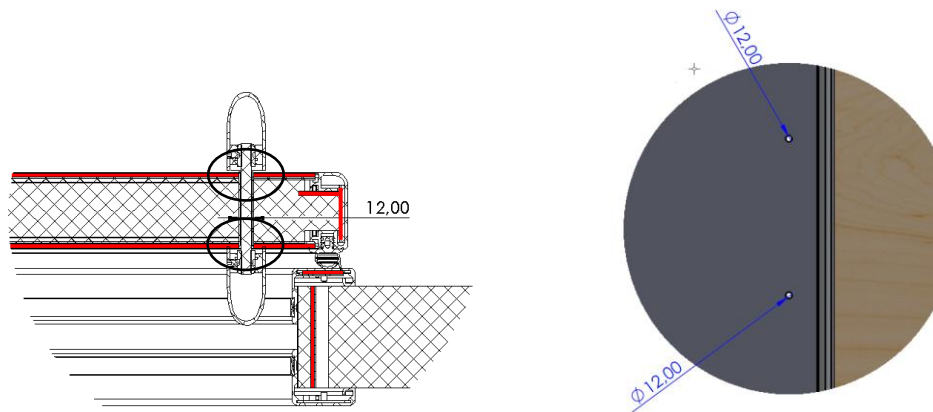


Figure 6. lead shielding at D-handle opener.

Flush Opener

When Flush opener configuration is used as openers, the small cutout must be milled into the door body to assembly the flush opener. To cover this slot, a lead casing is placed in the slot behind the opener as represented in the image below. This will provide complete protection against radiation at the opener.

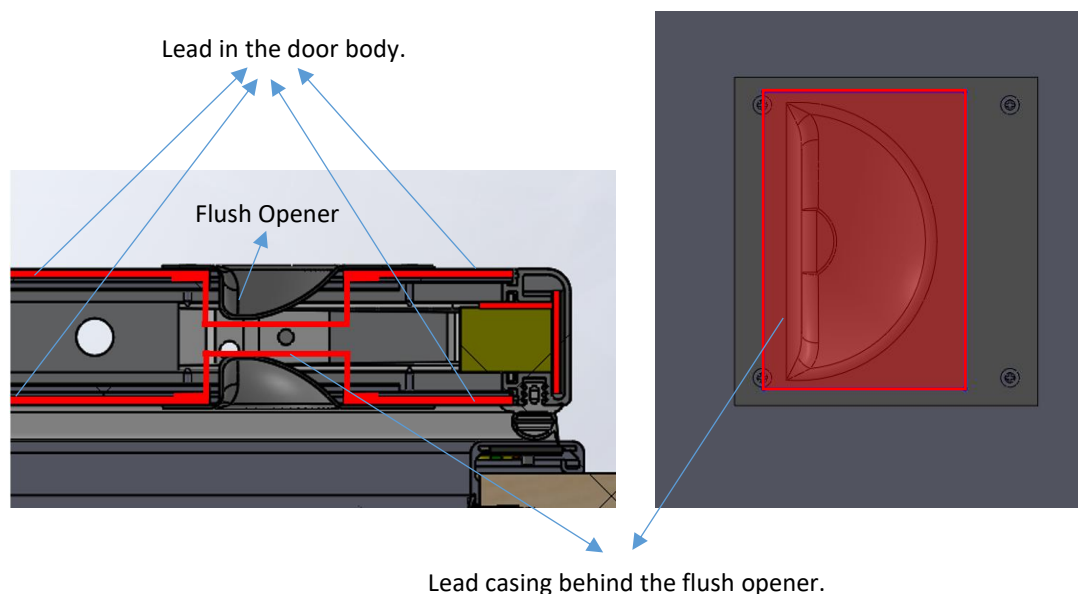



Figure 7. lead shielding at Flush opener.

Note: For further information about the door, windows and wall frames refer to the technical drawings and for any other thickness of lead other than the standards, and other door related queries please contact the sales team.

	Radiology statement MDCR Pb1-Pb4 (Lead 1mm - 4mm)	Procedure number- MDE-SE-PR-1023	Revision date -	Process Owner: Operations office Manager: R. Homan	
			Revision number 02	Author: Release date:	A. Anagol 17/04/2025

Combination of the flush opener and D-handle

To achieve the following configuration of the openers, a separate counter plate needs to be mounted inside the door body. By adding this counter plate, a portion of the lead in the door aluminum frame must be trimmed out. The image below illustrates the region where the lead is trimmed out of the door aluminum frame.

However, when the door is mounted on the rail and against a Metaflex wall frame, there is overall coverage in the direction perpendicular to the door body (can be seen in the image below marked in outline).

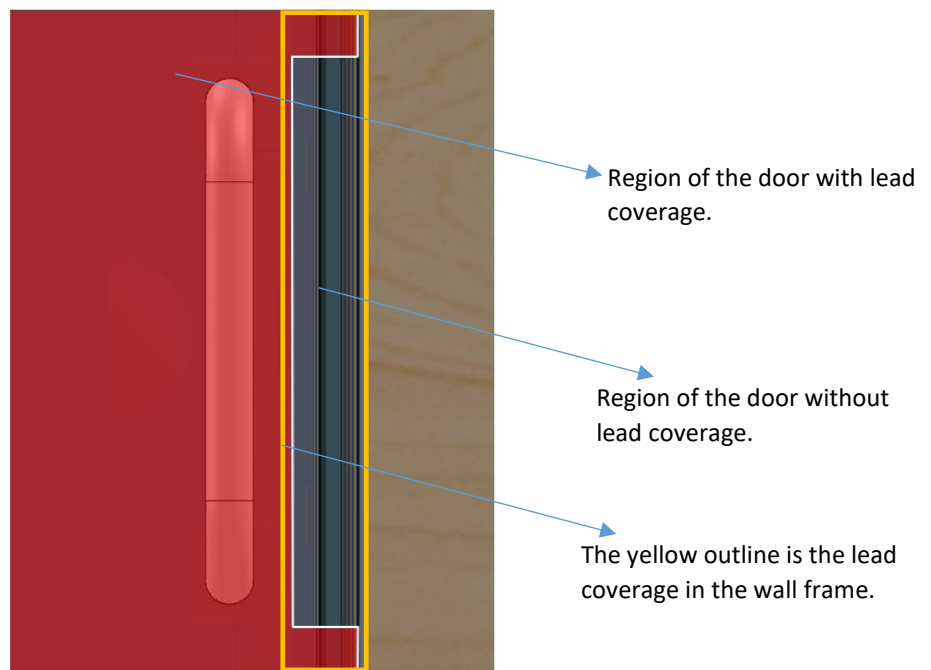



Figure 8. lead shielding at Flush opener.

A special modification kit is available to avail radiation leakage when the combination of the D-Handle and the Flush opener is used. Refer to the Finland modification kit.

Note: For further information about the door, windows and wall frames refer to the technical drawings and for any other thickness of lead other than the standards, and other door related queries please contact the sales team.

	Radiology statement MDCR Pb1-Pb4 (Lead 1mm - 4mm)	Procedure number- MDE-SE-PR-1023	Revision date -	Process Owner: Operations office Manager: R. Homan	
			Revision number 02	Author: Release date:	A. Anagol 17/04/2025

Medicare (Pb5-8) door body

Medicare (Pb5-8) door body is a solid door body without the foam core which the Medicare has. The lead coverage in the Medicare (Pb5-8) body is as shown in the images below.

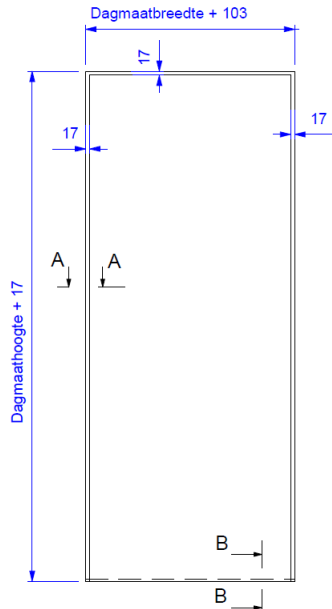
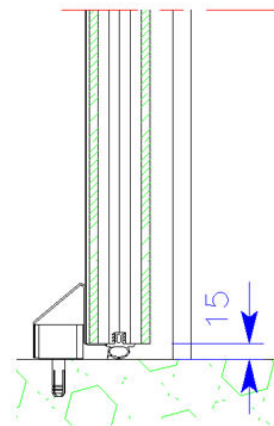
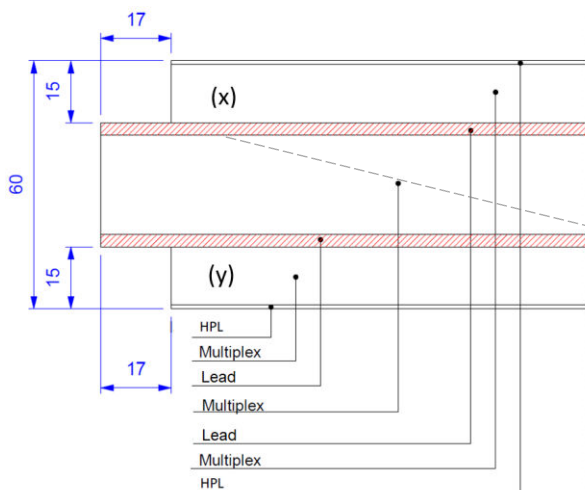


Figure 9. a) Medicare (Pb5-8) Door body



b) side view of the Lead coverage in a Medicare (Pb5-8) Door body

Unlike the foam core Medicare door body, the Medicare (Pb5-8) door body is fully solid and has lead coverage till the bottom of the door this is seen in Figure 10. The opener will still have the same cutouts as the Medicare with the foam body.



Door type	Wall frame	Side overlap in mm*	Overlap top in mm
Medicare	Oslo	60	40
Medicare	MK	60	40

* The overlap dimensions include the Aluminum frame.

Door type	x in mm	y in mm	Lead glass in mm	Openers
L5	2.5	2.5	Not possible	No information on leakage at the openers
L6	3	3		
L7	3.5	3.5		
L8	4	4		

Figure 10 Top view of the Lead coverage in a Medicare (Pb5-8) Door body

Note: For further information about the door, windows and wall frames refer to the technical drawings and for any other thickness of lead other than the standards, and other door related queries please contact the sales team.