Radiology statement EI1 Pb1- Pb3

Introduction

Metaflex Doors Europe offers a range of doors for radiation shielding. EI1 is a medical door with fire rating airtight/hermetic features.
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 (± 45° 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.

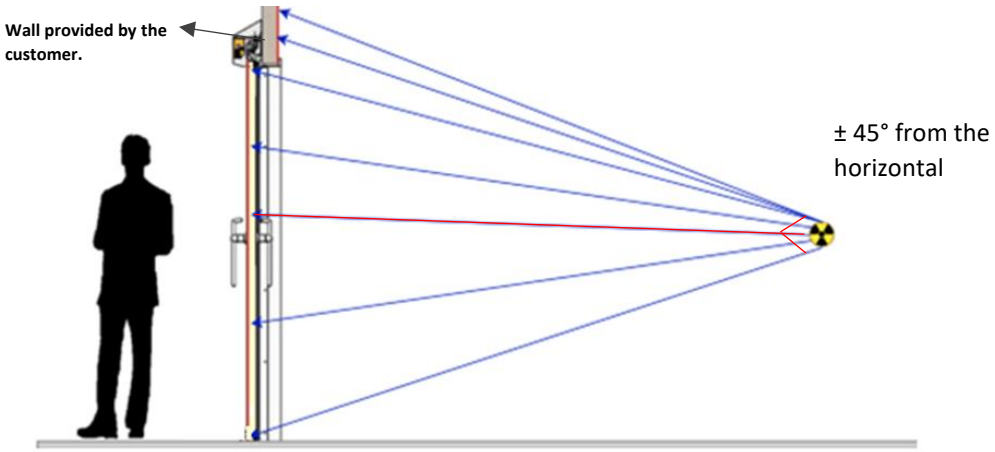

Figure 1 A Metaflex Medinox door providing radiation protection.

Figure 1 shows how the EI1 door system provides protection against radiation in an enclosure which has a source of radiation for radiological application.

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.

EI1 Door system

The EI1 door is offered in three standard lead configurations.

Door type	Wall frame	Side overlap in mm	Min side overlap in mm	Overlap top in mm
EI1	EI1	90	85	80

Table 1. Overlap distances for EI1 with the wall frame.

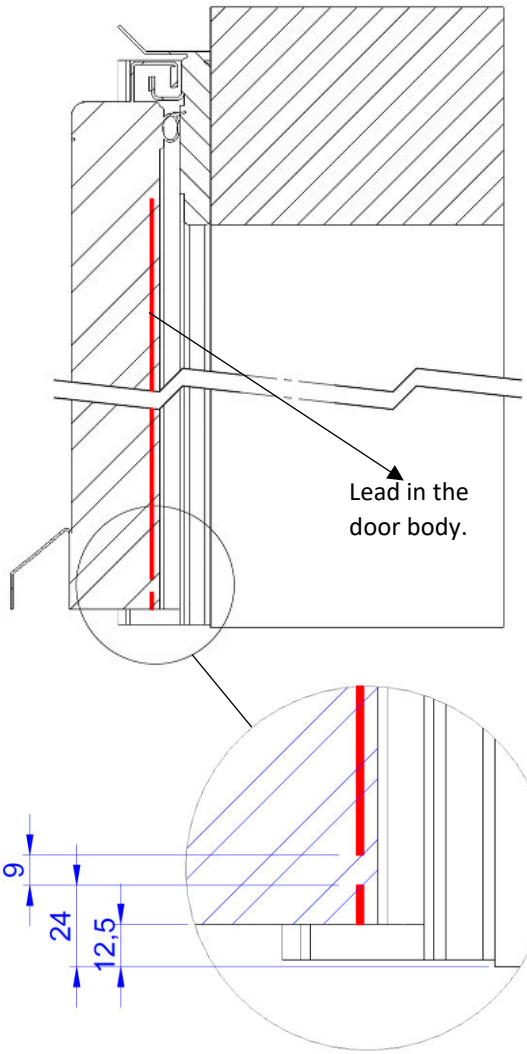

Figure 2 Side view cross section of a EI1.

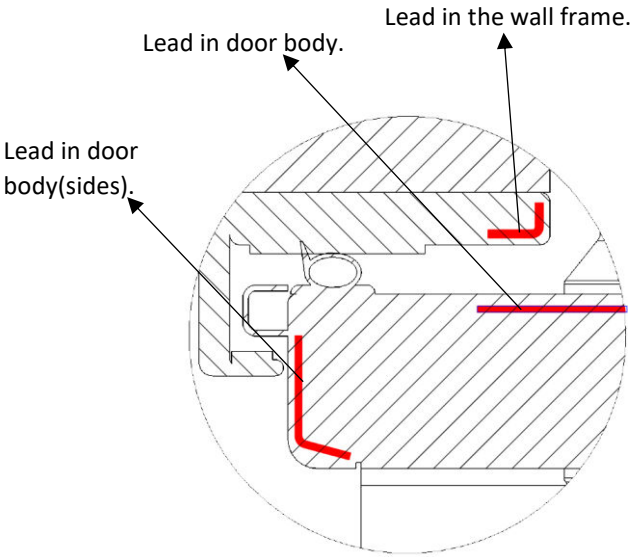

Figure 2a Top view cross section of a EI1 with wall frame.

Door type	Lead glass in mm
L1	≥ 1mm
L2	≥ 2mm
L3	≥ 3mm

Table 2. Lead thickness configurations.

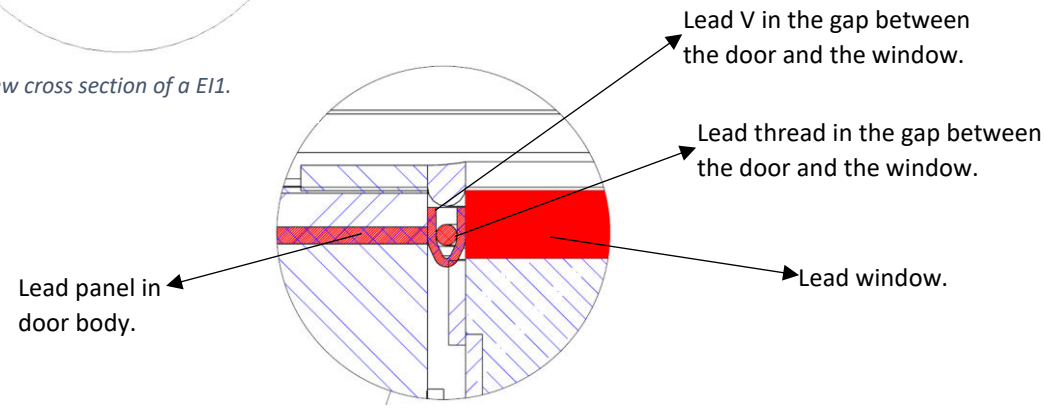

Figure 3 Window Lead thickness configuration

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Openers

Hermetic opener

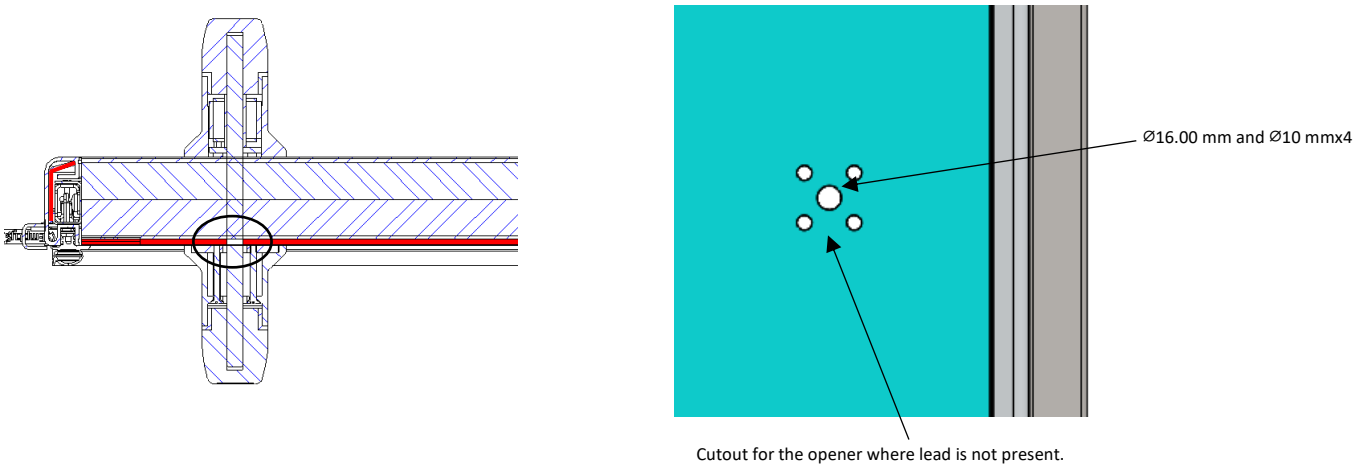

Figure 4 Lead shielding at the Hermetic opener.

Lead at the bottom of the door.

To accommodate the rubber gasket at the bottom of the door body, a slot of 9mm is milled into the door body as shown in the images below. This slot runs through the width of the door at 24mm from the bottom of the door. This also led to milling the lead leading to no shielding in the region of the slot. However, a customized solution can be implemented to provide better shielding if required.

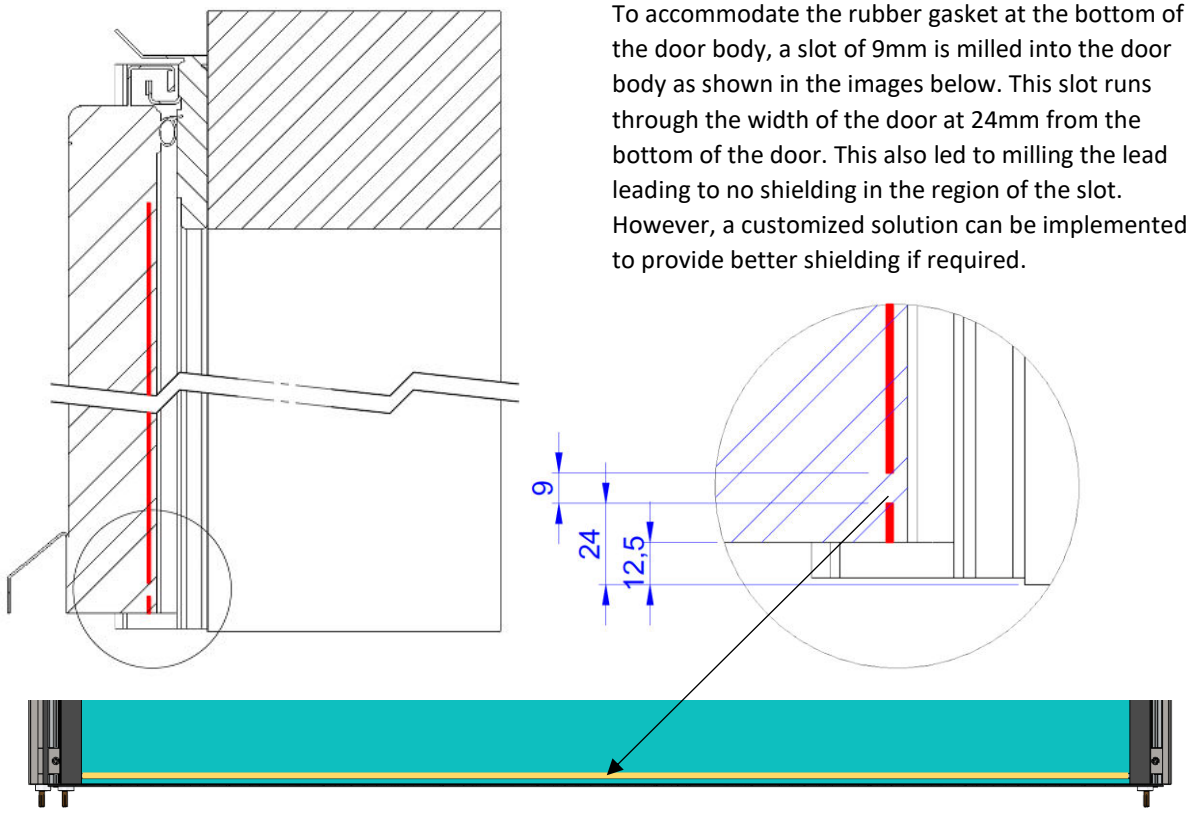

Figure 5 Lead shielding at the bottom of the door.

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