

## SHIELDED DOORS & BUNKER DOORS



Comecer is the world's leading manufacturer for the production of shielded doors. The shielding materials are: lead, paraffin and/or polyethylene and cadmium, in various thicknesses. Comecer also supplies bunker doors filled with concrete. Top priority is given to safety devices in order to ensure the maximum safety to the operators. Our technical experts are able to design the most suitable and cost-effective solution, according to the customer's needs in terms of shielding and dimensions.



**PMC - Motorised concrete doors for cyclotron bunkers**

The bunker door, especially designed for non self-shielded cyclotrons, consists of a steel framework entirely filled with concrete or barytic concrete. The movement is operated by a wheel system connected to the electric gear motor. The motor is controlled by an inverter that ensures a smooth and linear operation, with acceleration and deceleration ramps. The whole inside perimeter of the door has a silicon ring that is completely pressed when the door is closed, helping to ensure the required negative pressure inside the bunker. In case of emergency, the door can be manually opened. The safety devices are in compliance with the UNI 8612/89 standards



**SPM - Sliding doors with pneumatic movement-mobile threshold**

SPM doors have sliding wings and are equipped with a pneumatic/oleo-dynamic type of movement.

In order to ensure a radiation seal around the external perimeter, the wings overlap the existing wall opening, as recommended by safety guidelines.

The door slides along a built-in floor channel in order to create 100 mm of shielding overlap even in the lower part. The door drags a mobile stainless steel platform which maintains floor continuity when the door is open.

The doors are operated by a double-acting pneumatic cylinder which ensures smooth, linear and extremely silent movements.

The special pneumo-hydraulic control circuit, along with the pneumatic cylinder, have two important functions:

- Regulation of both opening and closing velocity
- Providing acceleration and deceleration ramps when in proximity of the stop position.

The SPM doors are equipped with wooden panels with an aluminium frame that covers the wing when the door is open.



**SPF - Sliding doors with pneumatic movement-fixed threshold**

The series of SFP doors have a sliding wing and are equipped with a pneumatic/oleo-dynamic type of movement.

In order to ensure a radiation seal around the external perimeter, the wings overlap the existing wall opening, as recommended by safety guidelines.

The door slides at approximately 5 mm of distance from the floor level. In this case the radiation seal is provided by a specially designed shielding construction located at the base of the wing, stopping any radiation leaks which could pass under the door.

The doors are operated by a double-acting pneumatic cylinder which ensures smooth, linear and extremely silent movements.

The special pneumo-hydraulic control circuit, along with the pneumatic cylinder, have two important functions:

- Regulation of both opening and closing velocity
- Providing acceleration and deceleration ramps when in proximity of the stop position.



**SFM - Electric shielded door, fixed threshold**

The SFM doors have a Comecer electro-mechanical operating system, which includes two steel wheels sliding and rolling on suspended wall guides and a moving system with a gear motor-pinion-rack. The gear motor is self-locking and maintains the door in a closed position during normal working conditions. The door can be manually unlocked by an electro-magnetic joint inserted between the gear motor and the pinion, if the emergency button is pressed or when there is no electric supply.



**SPI - Pneumatic hinged door**

The SPI shielded doors have a Comecer pneumatic operating system, which includes a pneumo-hydraulic cylinder. The door is in line with the floor, at a distance of approximately 5 mm, and the radiation seal in the lower part is provided by a specially designed shielding located at the base of the wing having the purpose of stopping the radiation leaks which could pass under the door.



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