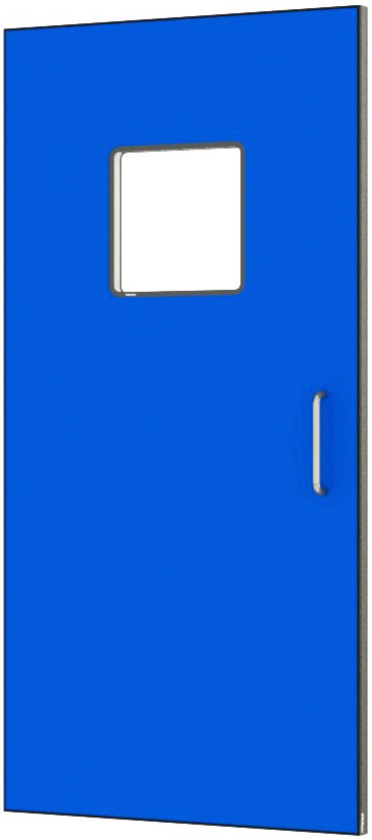
Panelled Leaf P50

1. Description



The **manusa P50** is a panelled leaf for sliding and swing doors.

It is available in phenolic resin or stainless steel finishes.

All its elements are assembled without overlaps, and the lacquered aluminium perimeter and the vision panel (optional) are **flush** to the body of the leaf, giving it a distinguished appearance.

The leaf is 50 mm thick and is made up of:

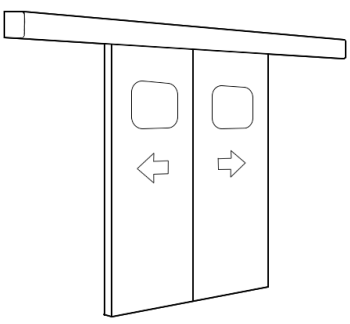
- Central polyisocyanurate core (PIR).
- Outer panel (according to order) in high density phenolic laminate (HPL) or stainless steel.
- Perimeter structure in aluminium profiles.

It is a product specifically designed for the **health sector** with the objective of guaranteeing:

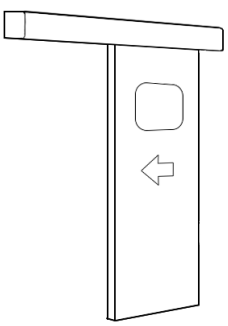
- **Cleaning:** the smooth surface of the leaf and the lack of visible nuts and bolts make it easier to clean and achieve the correct hygiene in the most demanding environments.
- **Safety:** with elements that guarantee electrical continuity for correct electrostatic discharge.
- **Airtightness (optional):** in both **manusa** hermetic sliding doors and hermetic swing doors, the leaf is sealed around its entire perimeter against the floor and frame, maintaining the positive and negative pressure as appropriate in the clean room so preventing contamination from dirt or micro-organisms.
- **X-ray opacity (optional):** solution for radiology rooms, its interior incorporating the necessary layer of lead.

In combination with the **Hermetic Visio+** operator and the **MK40** frame, it is the perfect solution for automatic hermetic sliding doors.

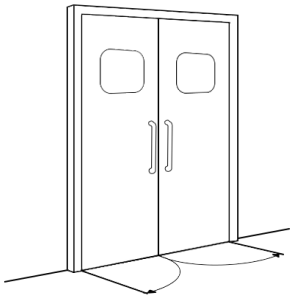
In combination with the **MKB** frame, hermetic swing doors are made in manual and automatic versions.



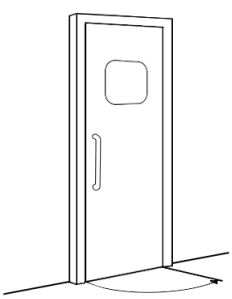
Bi-parting sliding



Single sliding



Bi-parting swing



Single swing

2. Versions

The **manusa P50** Leaf is available in different options:

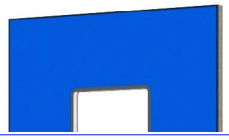
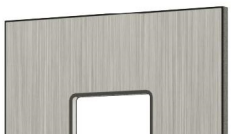
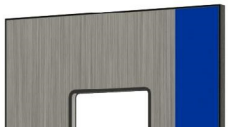
Non-Hermetic P50 Leaf:
Leaf without special airtightness requirements, can be used in combination with the **Visio+ 125** operator.

Hermetic P50 Leaf:
Equipped with seals, it provides high levels of airtightness in combination with a **Hermetic Visio+** operator and the sliding door frame **MK40**.

Leaded P50 Leaf:
Available in both the hermetic and non-hermetic configuration, it includes specific X-ray opacity requirements for use in radiology rooms.

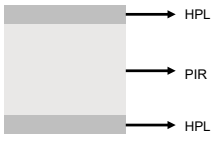
3. Finishes

The materials and finishes available for the P50 Leaf are:

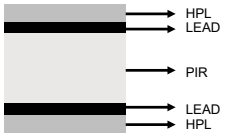
HPL	Max Compact phenolic resin as standard. With antibacterial certification, according to Standard JIS Z 2801 * Standard colours: blue, green, white and grey. (Optional SEFA 3-certified Plus finish for resistance to chemical agents).	
Stainless steel	Available in AISI-304 and AISI-316 qualities in Scotch grain 400 finish. ** AISI-316 stainless steel quality (optional) especially recommended for corrosive or saline environments.	
Mixed	Attractive combination of stainless steel and HPL finish.	
Glass	A tempered glass leaf with a 150 mm perimeter in HPL or stainless steel finish.	

COMBINATIONS	HPL	STAINLESS STEEL	MIXED	GLASS
Leaf front	Coloured HPL*	AISI-304 / AISI-316**	HPL + AISI-304 / AISI-316 STAINLESS STEEL**	HPL / AISI-304 / AISI-316 STAINLESS STEEL**
Leaf perimeter	Lacquered aluminium 9011	Lacquered aluminium 9011	Lacquered aluminium 9011	Lacquered aluminium 9011

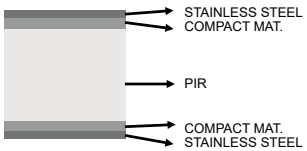
The structure of the panel is as follows, depending on the type of finish:



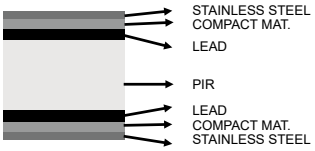
HPL



Leaded HPL



Stainless steel



Leaded Stainless Steel

4. Features

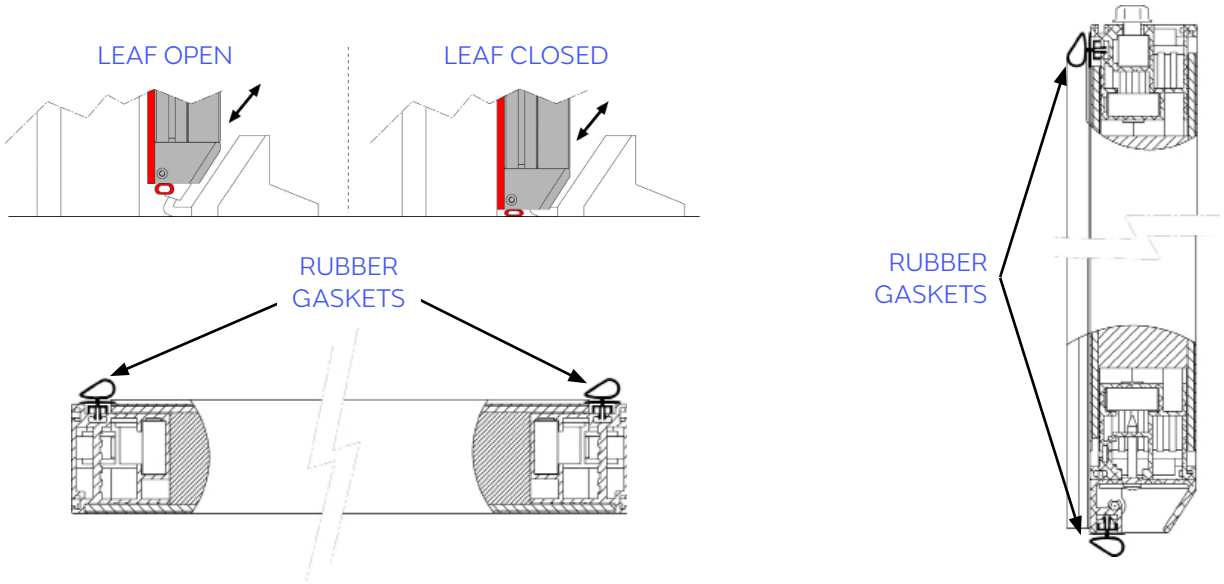
The **manusa P50** leaf is optionally equipped with special airtightness and X-ray opacity characteristics for applications in which one or both requirements are necessary.

4.1 Airtightness

The **Hermetic manusa P50** leaf is especially designed for installation in Clean Rooms with airtightness requirements.

SLIDING TYPE

In sliding doors with the **P50** leaf, airtightness is ensured thanks to the seal installed around the entire perimeter of the leaf that, combined with the **Hermetic Visio+** operator and the **MK40** frame, provides the air permeability values contained in the following table.



Air permeability test. Positive pressures.

The air permeability results at positive pressures obtained by the test sample were:

Total Pressure (Pa)		Total air permeability	Air permeability in relation to Total Surface Area		Air permeability in relation to Joint length	
Nominal	Real	m^3/h	$(m^3/h \cdot m^2)$	CLASS	$(m^3/h \cdot m)$	CLASS
50	48	<1.00	<0.3	CLASS D	<0.1	CLASS D
100	99	1.38	0.4	CLASS D	0.2	CLASS D
150	148	1.89	0.6	CLASS D	0.3	CLASS D
200 (1)	200 (1)	2.44	0.8	-	0.3	-

Air permeability table

(1) The air permeability measured at the total test pressure indicated is assessed on request by the client. This pressure is above the maximum test pressure established in Classification Standard UNE-EN 12207:2017 for interior pedestrian doors.

Classification according to:

- UNE-EN 12207:2017. "Windows and Doors. AIR PERMEABILITY. Classification"

Classification according to total surface area: Class D
Classification according to opening joint: Class D

Classification according to:

- UNE 85170:2016. "Pedestrian doors for operating rooms, clean rooms and controlled environment rooms"

CLASSIFICATION	CLASS 4

Air permeability test. Negative pressures.

The air permeability results at negative pressures obtained by the test sample were:

Total Pressure (Pa)		Total air permeability	Air permeability in relation to Total Surface Area		Air permeability in relation to Joint length	
Nominal	Real	m^3/h	$(m^3/h \cdot m^2)$	CLASS	$(m^3/h \cdot m)$	CLASS
-50	-48	<1.00	<0.3	CLASS D	<0.1	CLASS D
-100	-99	1.40	0.5	CLASS D	0.2	CLASS D
-150	-149	1.95	0.6	CLASS D	0.3	CLASS D

Air permeability table

Classification according to:

- UNE-EN 12207:2017. "Windows and Doors. AIR PERMEABILITY. Classification"

Classification according to total surface area: Class D
Classification according to opening joint: Class D

Classification according to:

- UNE 85170:2016. "Pedestrian doors for operating rooms, clean rooms and controlled environment rooms"

CLASSIFICATION	CLASS 4

Air permeability test. Average permeability.

The average air permeability results obtained by the test sample were:

Total Pressure (Pa)		Average air permeability - Total surface area		Average air permeability - Joint Length	
Nominal	Real	$m^3/h \cdot m^2$	CLASS	$(m^3/h \cdot m)$	CLASS
50	48	<0.3	CLASS D	<0.1	CLASS D
100	99	0.4	CLASS D	0.2	CLASS D
150	149	0.6	CLASS D	0.3	CLASS D

Air permeability table - Average results

Classification according to:

- UNE-EN 12207:2017. "Windows and Doors. AIR PERMEABILITY. Classification"

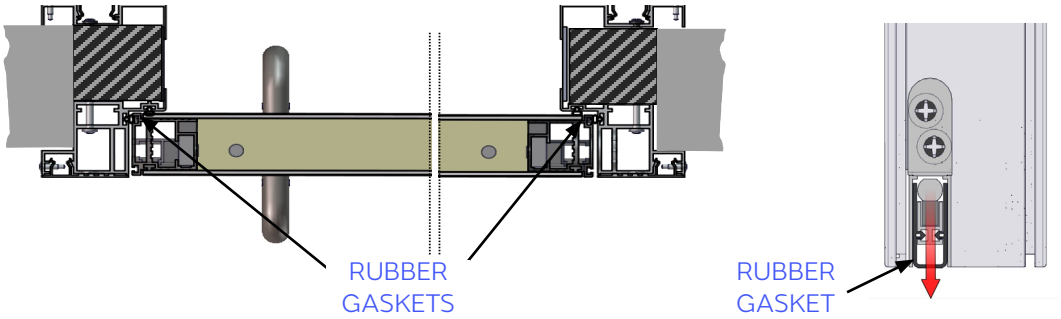
Classification according to total surface area:	Class D
Classification according to opening joint:	Class D

CLASSIFICATION	CLASS D

The file number of the classification obtained by manusa is the following:
Hermetic P50 Side-Sliding Door: Test report number: 21/32307206.
The tests were performed in the LGAI Technological Center, S.A. Laboratories (APPLUS Laboratories).

SWING TYPE

In swing doors, air permeability is reduced by the combination of the **P50** leaf and the moving joint at the bottom of it, together with the **MKB** frame with an airtight seal all around it. To obtain the airtightness shown in the test results, a mechanical resistance component (latch-only, latch and key, or key-only closure) must be included.



Air permeability test. Positive pressures.

The air permeability results at positive pressures obtained by the test sample were:

Total Pressure (Pa)		Total air permeability	Air permeability in relation to Total Surface Area		Air permeability in relation to Joint length	
Nominal	Real	m^3/h	$(m^3/h \cdot m^2)$	CLASS	$(m^3/h \cdot m)$	CLASS
50	50	2.74	1.5	CLASS D	0.5	CLASS D
100	101	4.62	2.5	CLASS D	0.8	CLASS D
150	150	6.25	3.3	CLASS D	1.0	CLASS D

Air permeability table

Classification according to:

- UNE-EN 12207:2017. "Windows and Doors. AIR PERMEABILITY. Classification"

Classification according to total surface area:	Class D
Classification according to opening joint:	Class D

Classification according to:

- UNE 85170:2016. "Pedestrian doors for operating rooms, clean rooms and controlled environment rooms"

CLASSIFICATION	CLASS 4

Air permeability test. Negative pressures.

The air permeability results at negative pressures obtained by the test sample were:

Total Pressure (Pa)		Total air permeability	Air permeability in relation to Total Surface Area		Air permeability in relation to Joint length	
Nominal	Real	m^3/h	$(m^3/h \cdot m^2)$	CLASS	$(m^3/h \cdot m)$	CLASS
-50	-50	2.64	1.4	CLASS D	0.4	CLASS D
-100	-99	4.42	2.4	CLASS D	0.7	CLASS D
-150	-151	5.91	3.2	CLASS D	1.0	CLASS D

Air permeability table

Classification according to:

- UNE-EN 12207:2017. "Windows and Doors. AIR PERMEABILITY. Classification"

Classification according to total surface area: Class D
Classification according to opening joint: Class D

Classification according to:

- UNE 85170:2016. "Pedestrian doors for operating rooms, clean rooms and controlled environment rooms"

CLASSIFICATION	CLASS 4

Air permeability test. Average permeability.

The average air permeability results obtained by the test sample were:

Total Pressure (Pa)		Average air permeability - Total surface area		Average air permeability - Joint Length	
Nominal	Real	$m^3/h \cdot m^2$	CLASS	$(m^3/h \cdot m)$	CLASS
50	50	1.4	CLASS D	0.4	CLASS D
100	100	2.4	CLASS D	0.7	CLASS D
150	151	3.3	CLASS D	1.0	CLASS D

Air permeability table - Average results

Classification according to:

- UNE-EN 12207:2017. "Windows and Doors. AIR PERMEABILITY. Classification"

Classification according to total surface area: Class D
Classification according to opening joint: Class D

CLASSIFICATION	CLASS D

The file number of the classification obtained by manusa is the following:
Hermetic P50 Swing Door: Test report number: 21/32307207.
The tests were performed in the LGAI Technological Center, S.A. Laboratories (APPLUS Laboratories).

4.4 Electrical safety

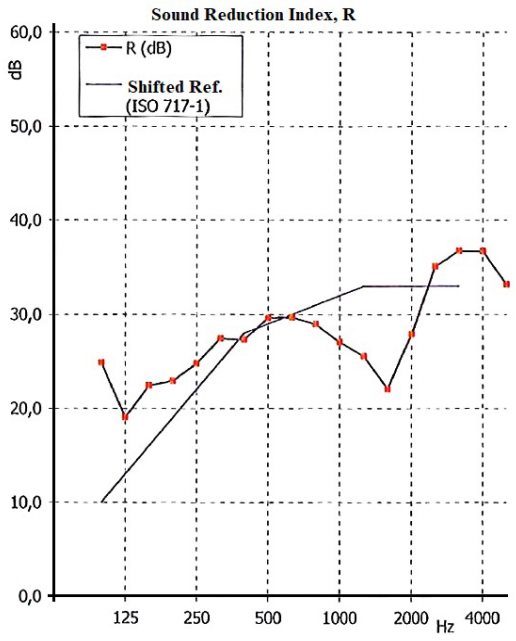
To comply with the electrotechnical regulation for low voltage (ITC-38), all accessible metal parts of the P50 leaf are separately connected so that they can be subsequently joined to the building's equipotential bonding busbar.

Impedance between these parts remains under 0.1Ω.

4.5 Acoustic insulation

Hermetic Sliding Doors equipped with **manusa hermetic P50** leaves have been subjected to a laboratory-based test to measure the airborne sound insulation of building elements according to Standard UNE-EN ISO 140-3:1995.

Frequency (Hz)	R (dB)	Uncertainty ±U
100	24.9	5.5
125	19.0	5.5
160	22.4	3.5
200	22.9	3.0
250	24.8	3.0
315	27.4	2.5
400	27.3	2.5
500	29.6	2.5
630	29.7	2.0
800	28.9	2.0
1000	27.0	1.5
1250	25.6	2.0
1600	22.1	2.0
2000	27.9	2.0
2500	35.1	2.0
3150	36.7	2.0
4000	36.7	2.0
5000	33.2	2.0



Global weighted sound reduction index A,R:	**27.7dBA**
Weighted sound reduction index, Rw (C100-5000; Ctr,100-5000):	**29 (-1;-3)dB**

The file number of the classification obtained by manusa is the following:
Hermetic P50 Side-Sliding Door File no. 07/32305121
The tests were performed in the LGAI Technological Center, S.A. Laboratories (APPLUS Laboratories).

4.6 X-ray Opacity

For installations on sites where this is an X-ray device, it is possible, on special order, to incorporate the equivalent of **2mm** or **3mm of lead** into a **manusa P50** leaf by obtaining the **Leaded P50** version.

A reference table is included below to assess the required lead thickness according to some of the conditions of the installation.

This table is only for information purposes because, to guarantee compliance with current law, a prior engineering study must be conducted for the installation by the customer to determine the required lead thickness in the door. The entire installation must then be authorised once the X-ray device has been installed in the room.

*The primary barrier is understood as being the wall behind the chamber in the direction of the primary beam. The remaining walls, floor and ceiling would be secondary barriers. In installations for X-ray rooms, the primary barrier is incorporated in the imaging system and, therefore, all the walls would be secondary.

Examples of barriers			
Secondary barrier with W=300 mA.min/week, to limit the dose to 0.1 mSv/week			
Voltage (kV)	**Distance (m)**	**Pb thickness (mm)**	**Concrete (mm)**
85	2	1.0	105
85	3	0.8	85
100	2	1.05	90
100	3	0.85	70
125	2	1.1	90
125	3	0.9	70

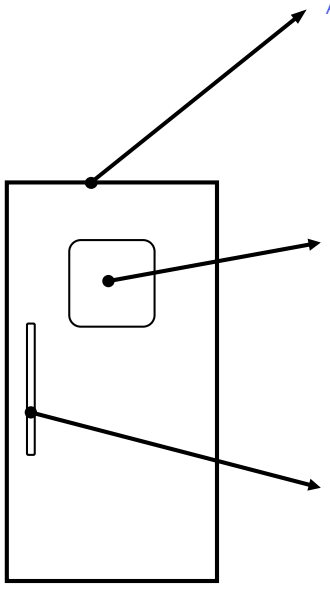
5. Technical specifications

Technical specifications	
Aluminium quality	EN AW-6063 T5 UNE-EN 755-2
Stainless steel quality	AISI 304 ASTM AISI 316 ASTM - Optional
Flatness tolerance	5 mm
Service temperature	10ºC to 30ºC
Relative service humidity	40% to 65% RH

Applicable directives	
Construction products	89/106/EEC
Low Voltage	2006/95/CE

6. Accessories

The exclusive accessories for this type of leaf are as follow:



Actuator
- Hermetic Visio+ Operator (1)
- Visio+ 125 Operator (1)
- Vector Automatic Swing Operator (2)
- Recessed door closer (hidden) in the leaf, EN 2-4 (2)

Vision panel
- Standard (Circular diam. 400 and 500 mm, Square 400x400, Rectangular 500x400mm and 900x800mm width x height)
- Pb — Leaded (Circular diam. 400 mm and Square 400x400mm)
- Automatic Venetian blind
- Dimming glass

Handle Lock
- 600mm tubular handle (Anti-bacterial treatment optional)
- 250mm tubular handle (Anti-bacterial treatment optional)
- Recessed handle (1)
- Handle and Lock (Latch only, Latch and key, Key only) (2)

(1) Option for Sliding P50 type only

(2) Option for Swing P50 type only

Considerations for dimming glass

Installation

1 – Every power source is associated with a specific glass. Each source is factory-tested with its glass, which should also be respected on site; otherwise, the glass will be supercharged and could be damaged.

2 – Under no circumstances must silicone other than that provided by the supplier be used. Any other silicone in contact with the glass could lead to damage.

Maintenance

1 – The glass must remain switched off for at least 4 hours every 24h and must be regularly switched on and off.

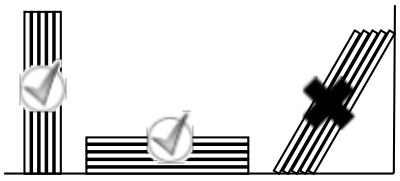
2 – Cleaning must be carried out with the glass in OFF mode and using water or alcohol-free products. The liquid must never touch the edge of the glass.

3 – Annual inspections: The wiring, the transformer, and the silicone, etc.must be inspected.

Warranty

1 – The level of transparency and appreciation of the slight variations in colour that are due to the product characteristics are not included in the warranty.

7. Storage, transport and cleaning recommendations



Always transport and store the leaves in their original packaging, always fully horizontal or vertical, **but never tilted**.

Do not stack more than 6 leaves.

Store the leaves in closed, dry enclosures not exposed to direct sunlight or to the rain, in **stable and controlled weather conditions**:

- Recommended storage temperature between 10 and 30ºC
- Recommended relative storage humidity between 40 and 65%

Outside these ranges, and in the event of sudden changes in both conditions, the P50 leaf may suffer dimensional and surface flatness variations.

For **normal leaf cleaning**, the products to be used will depend on the leaf finish:

- **Stainless steel:** normal detergents for basic cleaning or specific for stainless steel.
- **HPL:** normal detergents for basic cleaning and organic solvents to remove residues such as varnishes, glues and resins.
- **Seals:** normal detergents for basic cleaning.

Where leaf **disinfection** is required, the following products may be used:

- **Stainless steel:** sodium hypochlorite (bleach) in 0.5% aqueous solution. Then rinse with plenty of water and dry.
- **HPL:** Ethanol 70%, Formalin 1% and 5% p-chloro-m-cresol 0.3%, Tosychoramide sodium 1%, 5% Alkyl dimethyl benzyl ammonium chloride 0.1%, Alcohol, Aldehydes, Phenols, Quaternary ammonium compounds.
- **Seals:** sodium hypochlorite (bleach) in 0.5% aqueous solution. Then rinse with plenty of water and dry.

For any queries or doubts regarding the compatibility of any chemical or cleaning element, consult the manufacturer before it is applied.
The use of a spray with PRFTE or silicone spray is recommended for seal maintenance, after ensuring their use is permitted in the environment where the door is located.

Technical service and contact information of the manufacturer:
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manusa@manusa.com +34 900 827 700 | +34 935 915 700