# Doors for Health Buildings

Doors for operation theatres and internal doors



# **TECHNICAL MEMORANDUM**



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At MANUSA we manufacture under an intrinsecally safe design. We take actions to eliminate risks for safety and health of users. The main rules and regulations which apply are:

### 1 AIR PERMEABILITY

The buyer company will specify the particular requirements to be accomplished by hermetic doors. These requirements will depend on the aseptic conditions needed in the room. As a starting point, MANUSA establishes following minimum requirements:

| Average air overpressure in the room: | ±15 Pascals   |
|---------------------------------------|---------------|
| Maximum leakage flow:                 | 0,0139 m³ / s |

### Health Technical Memorandum

**03-01:** Specialised ventilation for healthcare ventilation for healthcare premises:

| T .                               |       | Pressure difference (Pa) |       |       |       |       |       |
|-----------------------------------|-------|--------------------------|-------|-------|-------|-------|-------|
| Туре                              | 5     | 10                       | 15    | 20    | 25    | 30    | 40    |
| Single door                       | 0.03  | 0.05                     | 0.06  | 0.06  | 0.07  | 0.07  | 0.08  |
| Double door                       | 0.04  | 0.08                     | 0.10  | 0.11  | 0.12  | 0.13  | 0.14  |
| High permanent length of 3 mm gap | 0.004 | 0.008                    | 0.010 | 0.011 | 0.012 | 0.012 | 0.013 |

The doorsets Manusa have the next flows through closed gaps (in m<sup>3</sup>/s):

| Turno             | Pressure difference (Pa) |         |         |         |         |         |         |
|-------------------|--------------------------|---------|---------|---------|---------|---------|---------|
| гуре              | 5                        | 10      | 15      | 20      | 25      | 30      | 40      |
| P-50 Sliding door | 0.00037                  | 0.00058 | 0.00076 | 0.00092 | 0.00107 | 0.00121 | 0.00146 |
| P-50 Swing door   | 0.00046                  | 0.00073 | 0.00096 | 0.00116 | 0.00134 | 0.00152 | 0.00184 |
| H-44 Sliding door | 0.00052                  | 0.00082 | 0.00108 | 0.00131 | 0.00152 | 0.00172 | 0.00208 |



P-50 Sliding door test



P-50 Swing door test



H-44 Sliding door test

Harmonized standard UNE-EN 12427 specifies test methods to evaluate air permeability in hermetic doors. harmonized standard UNE-EN 12426 classifies doors by its permeability as follows:

| Table 1 |   |   |  |
|---------|---|---|--|
|         | Per   | meability to air - Class                                      |  |
| Class   | Permeability to air Δp under a pressure of 50 Pa (m <sup>3</sup> /m <sup>2</sup> h) | Specifications  |  |
| 0       | <b>F</b>  | No particular requirements                                    |  |
| 1       | 24  |   |  |
| 2       | 12  |   |  |
| 3       | 6   |   |  |
| 4       | 3   |   |  |
| 5       | 1.5   |   |  |
| 6       |   | Exceptional (outstanding): agreement between manufacturer and |  |
|         |   | buyer on special permeability and pressure values.            |  |

**NOTE** – In the case of an applied pressure greater than 50 Pa, it is considered "exceptional" greater than class 5. We advise to sign a contract between the manufacturer and the customer.

On the other hand, harmonized standard EN 12207 classifies doors as follows:

|       | Table 1<br>Permeability to air - Class   |
|-------|--|
| Class | Permeability to air Ap under a pressure of 100 Pa (m <sup>3</sup> /m <sup>2</sup> h) |
| 0     |  |
| 1     | 50   |
| 2     | 27   |
| 3     | 9  |
| 4     | 3  |

MANUSA hermetic doors are designed and manufactured to assure the needed tightness as follows:

| MANUSA Model                | Air permeability<br>under a pressure of<br>100 Pa (m <sup>3</sup> /m <sup>2</sup> h) | Class according<br>to<br>UNE-EN 12207 | Air permeability<br>under a pressure of<br>50 Pa (m <sup>3</sup> /m <sup>2</sup> h) | Class according<br>to<br>UNE-EN 12426 | Remarks                                |
|-----------------------------|--|---------------------------------------|---|---------------------------------------|--|
| P-50 Sliding door           | 2.91   | 4                                     | 1,35  | 6                                     | Outstanding exceptional permeability   |
| H-44 Single<br>Sliding door | 4.41   | 3                                     | 1,96  | 5                                     | Excelent performance in a sliding door |
| H44 Central<br>Sliding door |  |                                       | 5.21  | 4                                     | Excelent performance in a sliding door |
| P-50 Swing door             | 4.26   | 3                                     | 2,68  | 4                                     | Excelent performance in a swing door   |

In order to achieve good durability in the products and achieve the performance, the swing doors must be installed so that the pressure acting in favor of closing the door. Test reports are available on the annexes.

### 2 DESIGN OF THE DOOR

### 2.1 AGING TEST

The leaves model P-50 have been subjected to an aging test under extreme conditions by humidity and temperature. The test has consisted to submit the leaves to cycles of aging under the following changing conditions:

- 1 6 hours at +40°C and 90% relative humidity.
- 2 6 hours in ramp, +40 ° C to -20 ° C without specific conditions of humidity.
- 3 6 hours at -20 ° C and 80% relative humidity.
- 4 6 hours in ramp, -20 ° C to +40 ° C without specific conditions of humidity.

After each cycle was examined the general state of sample. No faults have been appreciated therein. The following test images are two examples of that:



### **2.2 OPENING SWITCH WITHOUT CONTACT**

**Free opening controls contact.** If the requirements for electrostatic charge are very demanding, we recommend the use of proximity as opening control buttons instead of touch. This type of control also contributes to better hygiene and comfort features, not being necessary to the contact, since it is sufficient to approximate any object to open the door.

### **2.3 LEAF SURFACE**

Some design characteristics are established in International Standard UNE-EN ISO 14644-4:

The doors should have as less different horizontal surfaces as possible, paying special attention to minimize the steps and flanges in the door surface.(...) The door knobs, when they are necessary, should be flush mounted, without possibility of snagging, and easy to clean.

**UNE-EN ISO 14644-4.** Clean rooms an annex controlled rooms. Part 4: Design, construction and comissioning.

The leaves Manusa **do not run on guides**, so that no gaps occur and cleaning hard flanges. Insofar as possible, the **door handles** are quite smooth and without edges.



LINEA AUTOMATIC GUIDE with glass leaf



LINEA AUTOMATIC GUIDE with leaf P-50

### **3. EQUIPOTENTIAL CONNECTIONS**

*Every accessible metallic parts must be connected to the equipotential bars, by means of isolated and independent copper conductors. The impedance between these parts and the bar will not be greater than 0.1 ohm.* 

**Low Voltage Electrotechnical Regulations. Regulation ITC-38:** Special purpose installations. Particular requirements for electrical installations in operation theatres.

The electrostatic charge accumulation and subsequent electrostatic discharge may present a risk of danger such as an explosion (in the presence of dust or gases), damage mechanisms (eg damage to optical or electronic components) or excessive attraction of particles to surfaces, contributing to physical, chemical and microbiological pollution.

Where the above risks may occur, the materials used in the construction of facilities should not create or maintain a significant static charge. The needed value will be established in each case and should be clearly specified by the purchaser.

**UNE-EN ISO 14644-4.** Clean rooms an annex controlled rooms. Part 4: Design, construction and comissioning.

### **3.1 GROUNDING CABLE SECTION**

Standard section in MANUSA doors is 2.5 mm2. Applications with special requirements should be clearly specified by the purchaser.

### **3.2 GROUNDING IN THE END OF TRAVEL OF THE DOOR**

According to the Machinery Directive, a pedestrian automatic door is a single and indivisible machine, so no special features may be required to parts and / or components, but the requirements of the parts affect globally to all the door. All sliding doors operating theater devices have grounding in the end of travel of the leave. Electrical continuity is assured by the continuity of all metal parts of the machine. All doors have discharge devices at the end of the travel of the leave. Electrical continuity of metallic parts is assured.

### **3.3. GROUNDING THROUGHT ALL THE CYCLE**

Device grounding optional continuous throughout the operating cycle of the door. MANUSA understands the door as a unique machine and discharges as a whole to ground. If the project management of the hospital understands otherwise we can differentiate different parts of the door (frame, leaf, operator). An optional device partition allows separate connections for different parts of the machine.

### **4 ACOUSTIC ISOLATION**

According to EN ISO 10140-2, adaptation range is the value, Rw in decibels, to be added to the value of the global magnitude to account for the characteristics of a particular spectrum. These parameters are introduced the rule to reflect the different spectra of the noise sources (such as noise and traffic noise) and for evaluating sound insulation curves with very low values in one frequency band.

The sounds that must isolate a watertight door of the operating room are the ones that correspond to the human voice, especially the cries and screams that can occur in the outer aisles. These sounds have a frequency of between 3500 and 5000 Hz sound reduction indices of watertight doors MANUSA P-50 are as follows:

| Frequency (Hz) | Acoustic isolation R (dB) |  |
|----------------|---------------------------|--|
| 100            | 19.8                      |  |
| 125            | 20.4                      |  |
| 160            | 25.1                      |  |
| 200            | 20.7                      |  |
| 250            | 23.3                      |  |
| 315            | 24.8                      |  |
| 400            | 26.5                      |  |
| 500            | 28.3                      |  |
| 630            | 29.1                      |  |
| 800            | 29.8                      |  |
| 1000           | 28.8                      |  |
| 1250           | 28.8                      |  |
| 1600           | 25.2                      |  |
| 2000           | 22.8                      |  |
| 2500           | 29.8                      |  |
| 3150           | 35.1                      |  |
| 4000           | 36.7                      |  |
| 5000           | 37.6                      |  |

# **Doors for Health Buildings**

### **5 RADIATION PROTECTION ACCORDING UTPR REGULATION**

The MANUSA doors intended for diagnostic radiology rooms are manufactured in accordance with **Directive 96/29 / EURATOM** and technical guides and reference standards for **Radiation Protection Techniques Units (UTPR).** 

Our leaded doors radiology rooms ensure the isolation of space thanks to its lead shielding, both in leaf and in the sight glass. MANUSA doors radiology shield has a standard lead 2 mm. On request and depending on the intended use of the room, you may make them more lead shielding.







Imágenes del ensayo realizado por la **UTPR TÜV NORD Cualiontrol**. Se aprecia el resultado de aislamiento radiológico total:

# 0,0 μSv/h

### 6 ACCORDANCE WITH UK REGULATION

Doors for healthcare buildings Manusa qualify Department of Health UK. Verification of conformity has been certified by Underwriters Laboratories:

| Uthe standard in saf  | ety  | Underwriters<br>Laboratories  |
|---|--|---|
| Project No.: 13CA26246<br>Issue Date: 2013/07/31  |  |   |
| Issued to:  | MANUSA DOOR SYSTEMS, S.L.<br>Av. Via Augusta 85<br>08174 – Sant Cugat del Vallès (BARCELONA, S   | SPAIN)  |
| This is to certify that:  | According to the <b>Doors for Health Buildings</b> docum<br>(D00041 Rev:02-10/05/2013), the products included<br>based and comply with:  | ient<br>in it are   |
|   | <ul> <li>HTM 58 Internal door sets. HTM Building compor</li> <li>HTM 03-01: Specialized ventilation for healthcare</li> </ul>  | ents series<br>premises   |
| In addition:  | All the included data have also been reviewed and ve<br>through all the necessary Test Certificates documente  | rified<br>ed below:   |
|   | <ul> <li>Air Permeability</li> <li>Grounding of all the Non-energized Metallic Parts</li> <li>Acoustic Insulation</li> <li>Thermal Aging</li> <li>Functional Check</li> <li>EMC &amp; electrical safety.</li> </ul>  |   |
|   | The Doors for Health Buildings document also establ<br>practices for materials selection criteria and gives rule<br>thickness in radiological applications.  | ishes best<br>es for lead   |
| The issuance of this certificate in<br>the use of UL Listing, Classificati<br>product. You cannot use this test<br>advertising, promotion or market | no way implies Listing, Classification or Recognition by UL and does n<br>on or Recognition Marks or any other reference to UL on or in connect<br>data or UL's name or marks in connection with any product, packagir<br>ing without UL's prior written permission. | ot authorize<br>tion with the<br>15,  |
| Issued by:  | Reviewed by:   |   |
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| Joaquim A<br>Field Representative<br>Department: 9056XBAR<br>E-mail: joaquim.arisso@ul.com  | rissó Ramon Puerta<br>Area Manager<br>Department: 9056XBAR<br>E-mail: ramon.puerta@ul.com  |   |
| Registro Mercantil de Barcolo na, Tomo 34.164<br>Sección General, Folio 88, Hoja 240.856<br>Lescrinsciat 11-0.P. 8-42706800                         | Undaravri<br>Av. Diagoral 407.4° 1°,<br>T: 34.93.368,1300 / F: 34.93.34  | ars Laboratories Ibérica S.L.<br>E - 08008 Barcelona, Spain<br>2.4996 / W:: ul-europe.com |

### **ANNEXES:**

- 1 Operator VISIO HERMETIC. Conformity assessment
- 2 LINEA AUTOMATIC GUIDE. Conformity assessment
- 3 P-50 SLIDING DOORS. Air permeability test
- 4 P-50 SWING DOORS. Air permeability test
- 5 H-44 SLIDING DOORS. Air permeability test
- 6 P-50 SLIDING DOORS. EQUIPOTENTIAL CONNECTION
- 7 P-50 SWING DOORS. EQUIPOTENTIAL CONNECTION
- 8 P-50 SLIDING DOORS. Sound Reduction Index
- 9 RADIOLOGIC DOORS. Isolation according UTPR regulation

#### 1 **Operator VISIO HERMETIC. Conformity assessment**



TEST CERTIFICATE

### manusa 🔂

MANUSA DOOR SYSTEMS

Powered pedestrian doorsets for operating rooms and clean rooms

**1 TEST SAMPLES DEFINITION** 

TÜV Rheinland Ibérica Inspection, Certification & Testing, S.A., has made the functional testins of two powered pedestrian doorses: according to the applicable regulations and the manufacturer's protocol defined in the document D00041-01.

### **2 NORMATIVE REFERENCES**

| 2.1 [ | Directives: |   |
|-------|-------------|---|
|       | 2006/42/CE  | Machinery Directive.                    |
|       | 89/106/CE   | Construction Product Directive.         |
|       | 2004/108/CE | Electromagnetic Compatibility Directive |
|       | 2006/95/CE  | Low Voltage Directive.                  |

### 2.2 Armonized standards:

UNE-EN 60335-1 UNE-EN 61000-3-2/3-3/6-2/6-2 UNE-EN ISO 13849-1/2 UNE EN ISO 12100-1/2 UNE-EN ISO 13857 UNE-EN ISO 14121-1/2 UNE-EN 1037 **UNE-EN 10327** 

2.3 Other documents:

Technical Building Code. UNE 85121. Powered pedestrian doorsets. Put into service, use and maintenance.

### **3 TEST SAMPLES**

3.1 Powered pedestrian doorsets for operating rooms and clean rooms

| Model: VISIO HERMÉTICO      | Model: VISIO HERMÉTICO      |  |
|-----------------------------|-----------------------------|--|
| Leaf model: P-50            | Leaf model: P-50            |  |
| Leaf weight: 200 Kg.        | Leaf weight: 90 Kg.         |  |
| Serial Nº: GIEL010412160041 | Serial Nº: GIEL010412160040 |  |

The proof of these doors has been carried out by the undersigned technician belonging to TÜV Rheinland Ibérica Inspection, Certification & Testing, S.A., as tead Independent Inspection according to their training and their powers, on the date indicated.

El Prat de Llobregat, January 8th 2013



David Rodríguez Carballas

Delegación de El Prat de Llobregat C/ Garrotxa, 10-12, Edificio Océano Parc de Negocis "Mas Blau" 08820 E Prat de Llobregat Tel: 93 478 11 31

### 2

### LINEA AUTOMATIC GUIDE. Conformity assessment



Accredited by ENAC according to EN ISO/IEC 17025:2005



### **EMC Test Report**

Customer: Linear Motor Applications

Model: MINI 52

Serial number: Approval sample Id:001

Test Report ID Number: BE2011192

Test Report version: 1.1

Total Number of pages: 68

Test standards: EN61000-6-2:2005 EN61000-6-3:2007 EN61000-3-2:2006 EN61000-3-3:2008

Edited by:

Edward town

Eduard Palacio EMC Laboratory Engineer

Revised by: (fts David Ortiz Head of EMC Laboratory

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Compliance Laboratory.

IDNEO TECHNOLOGIES S.L. Polígon Industrial Can Mitjans s/n 08232 Viladecavalls - Barcelona - Spain

Telephone +34937008178 Fax +34937008168

PRODUCT: Guía Automática E-motion para puerta corredera de 1 hoja. MANUFACTURER: Línear Motor Applications, S.L. MODEL: E-motion STANDARD: IEC 60335-2-103:2006 (Second Edition) and IEC 60335-1:2001 (Fourth Edition), incl. A1:2004, and A2 : 2006, C1:2006, IEC 62233: 2005 (First Edition

TEST REPORT ID. 2012003

Commercial-in-confidence

Mónica Morales Testing engineer

Carlos Navarro Head of Safety Laboratory

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#### 3 P-50 SLIDING DOORS. Air permeability test





### Bellaterra:

Applicant Reference:

09th november 2007 BEDOB, S.L. Ctra. Pla de Santa Maria Km 1,2 43800 Valls Tarragona

Date of the tests:

TESTED MATERIAL A 1 sliding leave door with fixed glass, for inner use, total dimensions (frame included) of 2150 x 1550mm (height x width) and trade reference P50 HERMETIC SINGLE SLIDE.

31th october 2007

TEST REQUESTED Initial Type Test on the tested material described above in order to determinate his Air Permeability at Low Pressures, defined by the Applicant.

### **CLASSIFICATION**

The tested door is according to the test requested obtaining this classification:

| Pressu       | re        | Total Air loss | Air loss respect Door area | Air loss respect Seal lengt |
|--------------|-----------|----------------|----------------------------|-----------------------------|
| Nominal (Pa) | Real (Pa) | m³/h           | m³/h · m²                  | m³/h ∙ m                    |
| 15           | 17        | 0,78           | 0,23                       | 0,10                        |
| 20           | 17        | 0,78           | 0,23                       | 0,10                        |
| 30           | 26        | 2,09           | 0,62                       | 0,28                        |
| 40           | 36        | 3,43           | 1,02                       | 0,46                        |
| 50           | 46        | 4,53           | 1,35                       | 0,61                        |
| 75           | 71        | 7,15           | 2,14                       | 0,96                        |
| 100          | 97        | 9,71           | 2,91                       | 1,31                        |
| -15          | -15       | 4,56           | 1,36                       | 0,61                        |
| -20          | -19       | 5,28           | 1,58                       | 0,71                        |
| -30          | -31       | 6,35           | 1,90                       | 0,85                        |
| -40          | -39       | 7,13           | 2,13                       | 0,96                        |
| -50          | -49       | 7,73           | 2,31                       | 1,04                        |
| -75          | -74       | 9,43           | 2,82                       | 1,27                        |
| -100         | -99       | 10,68          | 3,20                       | 1,44                        |

Jordi Mindbent Junyent Fire department responsible LGAL Technological Center, S.A. . 0

Albert Genter, S.A. Technican Sponsible LGAI Technological Center, S.A.

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### 4 P-50 SWING DOORS. Air permeability test

| ADDRESS     CITRA. PLA DE SANTA MARIA, POL IND. N° 235-239       ES 43800 VALLS (TARRAGONA)       CENTIFICATE N°       23898-4         DOOR OF STEEL       (1.000 x 2.160) mm       REF. «PUERTA BATIENTE P50»         Image: Citra display="block">Image: Citra display=block       Image: Citra display=block         DOOR OF STEEL       (1.000 x 2.160) mm       REF. «PUERTA BATIENTE P50»         Image: Citra display=block       Image: C   |  | COMPANY MANUSA  | ND 110 005 000 |
|--|--|---|----------------|
| CERTIFICATE N       23898-4         DOOR OF STEEL       (1.000 x 2.160) mm         (1.000 x 2.160) mm       REF. «PUERTA BATIENTE P50»         Image: transform  |  | ES 43800 VALLS (TARRAGONA)  | ND. Nº 235-239 |
| DOOR OF STEEL   (1.000 x 2.160) mm   REF. «PUERTA BATIENTE P50»     Image: treat interval i |  | ERTIFICATE Nº 23898-a   |                |
| DOOR OF STEEL         (1.000 x 2.160) mm         REF. «PUERTA BATIENTE P50»         Image: Construction of the state                                     |  |   |                |
| (1.000 x 2.160) mm         REF. «PUERTA BATIENTE P50»         Image: Construction of the state of the st          |  | DOOR OF STEEL   |                |
| REF. «PUERTA BATIENTE P50»         TEST       RESULT         AIR PERMEABILITY<br>(UN.E-EN 12427:2000)       CLASSE 4         ACITVATED DCOR       AIR PERMEABILITY<br>(UN.E-EN 12427:2000)       CLASSE 4         AIR PERMEABILITY<br>(UN.E-EN 12427:2000)       CLASSE 3         DEACTIVATED DOOR       CLASSE 3  | 0  | (1.000 x 2.160) mm  |                |
| TEST     RESULT       AIR PERMEABILITY<br>(UNE-EN 12427:2000)     CLASSE 4       ACTIVATED DCOR     AIR PERMEABILITY<br>(UNE-EN 12427:2000)       AIR PERMEABILITY<br>(UNE-EN 12427:2000)     CLASSE 3       DEACTIVATED DOOR     CLASSE 3   |  |   | TE P50»        |
| TESTRESULTAIR PERMEABILITY<br>(UN.E-EN 12427:2000)<br>ACTIVATED DCORCLASSE 4AIR PERMEABILITY<br>(UN.E-EN 12427:2000)<br>DEACTIVATED DOORCLASSE 3   |  | REF. «FOERTA BATIEN   | TE F30#        |
| AIR PERMEABILITY<br>(UN.E-EN 12427:2000)<br>ACTIVATED DCOR<br>AIR PERMEABILITY<br>(UN.E-EN 12427:2000)<br>DEACTIVATED DOOR<br>CLASSE 3   |  | TEST  | RESULT         |
| (UNE-EN 12427:2000)     CLASSE 4       ACTIVATED DCOR     AIR PERMEABILITY<br>(UNE-EN 12427:2000)     CLASSE 3       DEACTIVATED DOOR     CLASSE 3   | in the second se | AIR PERMEABILITY  |                |
| AIR PERMEABILITY<br>(UNE-EN 12427:2000)<br>DEACTIVATED DOOR<br>CLASSE 3  |  | (UNE-EN 12427:2000)   | CLASSE 4       |
| UUNE-EN 12427:2000)<br>DEACTIVATED DOOR<br>CLASSE 3  |  | AIR PERMEABILITY  |                |
| CD DEACTIVATED DOOR  | 1.1.1  | (UNE-EN 12427:2000)   | CLASSE 3       |
| 8  |  | DEACTIVATED DOOR  |                |
|  | CER  | ACTIVATED DCOR<br>AIR PERMEABILITY<br>(UNE-EN 12427:2000)<br>DEACTIVATED DOOR | CLASSE 3       |
|  |  |   |                |
|  |  |   |                |
|  |  |   |                |
|  |  |   |                |

#### H-44 SLIDING DOORS. Air permeability test 5





Bellaterra:

Applicant Reference:

09th november 2007

Page 1/1

Date of the tests:

REDOR, S.L. Ctra. Pla de Santa Maria Km 1,2 43800 Valls Tarragona 05th november 2007

TESTED MATERIAL

A 2 sliding leaves door in aluminium with glass, for inner use, total dimensions (frame included) of 2110 x 2080mm (height x width) and trade reference C44 BI-PART.

### TEST REQUESTED

Initial Type Test on the tested material described above in order to determinate his Air Permeability at Low Pressures, defined by the Applicant.

### CLASSIFICATION

The tested door is according to the test requested obtaining this classification:

| Pressure     |           | Total Air loss | Air loss respect Door area | Air loss respect Seal length |  |  |
|--------------|-----------|----------------|----------------------------|------------------------------|--|--|
| Nominal (Pa) | Real (Pa) | m³/h           | m³/h · m²                  | m³/h · m                     |  |  |
| 15           | 15        | 10.68          | 2,43                       | 0,84                         |  |  |
| 20           | 16        | 10.96          | 2,49                       | 0,87                         |  |  |
| 30           | 26        | 15.45          | 3,52                       | 1,22                         |  |  |
| 40           | 36        | 19.28          | 4,39                       | 1,53                         |  |  |
| 50           | 46        | 22.90          | 5,21                       | 1,82                         |  |  |
| -15          | -15       | 12.88          | 2,93                       | 1,02                         |  |  |
| -20          | -15       | 12.96          | 2,95                       | 1,03                         |  |  |
| -30          | - 31      | 20.40          | 4.64                       | 1,62                         |  |  |
| -40          | -41       | 23.98          | 5,46                       | 1,90                         |  |  |
| -50          | -49       | 26.80          | 6,10                       | 2,13                         |  |  |



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### P-50 SLIDING DOORS. EQUIPOTENTIAL CONNECTION

### LGAI

6

LGAI Technological Center, S.A. Campus UAB Apartado de Correos 18 E - 08193 Bellaterra (Barcelona) F +34 93 567 20 01



# TEST REPORT

Test report 09/34601705M1 Date 05/03/2009 "English translation from the original in Spanish"

Page 1 of 6



Customer's reference REDOR, S.L. Ctra Pla de Santa Maria

235-239 Pol. Ind. Valls 43800 Valls (Tarragona) SPAIN

The received product

an automatic hermetic door, manufactured by REDOR, S.L., trademark MANUSA, model HERMETIC SLIDING DOOR

Has been tested and found in conformity with the specifications of applied clauses of the standard/s

- Clause 27.5 of chapter 27 "Provision for earthing" of UNE-EN 60335-1:2002+A11:04+ A1:05 +ERR:05+A12:06+CorrA1:2007+A2:2007 and 60335-2-103:2005
- Clause 2.1.2 of ITC-BT-38 of RD 842/2002\* (Electrotechnician Regulation of Low Voltage)

Document marked with \* is not included in the accreditation scope

This report annuls and replaces at report 09/34601705 emitted on 27/02/2009. Description of modification: The structure of report is modified according to customer

LGAI Technological Center, S.A.

Albert Marginet i Morales Responsable C.T. Electricidad IT & Telecom B.U. LGAI Technological Center, S.A.

LGAI Technological Center, S.A

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### 7 P-50 SWING DOORS. EQUIPOTENTIAL CONNECTION

### LGAI

LGAI Technological Center, S.A. Campus UAB Apartado de Correos 18 E - 08193 Bellaterra (Barcelona) T +34 93 567 20 00 F +34 93 567 20 01 www.applus.com



# **TEST REPORT**

**Test report** 09/34601981 "English translation from the original in Spanish" Date 05/03/2009 Page 1 of 6

ENAC Nº 9/LE/894 Customer's reference

**REDOR, S.L.** Ctra Pla de Santa Maria 235-239 Pol. Ind. Valls 43800 Valls (Tarragona) SPAIN

### The received product

an automatic hermetic door, manufactured by **REDOR, S.L.**, trademark **MANUSA**, model **HERMETIC SWING DOOR** 

Has been tested and found in conformity with the specifications of applied clauses of the standard/s

- Clause 27.5 of chapter 27 "Provision for earthing" of UNE-EN 60335-1:2002+A11:04+ A1:05 +ERR:05+A12:06+CorrA1:2007+A2:2007 and 60335-2-103:2005
- Clause 2.1.2 of ITC-BT-38 of RD 842/2002\* (Electrotechnician Regulation of Low

Voltage) Document marked with \* is not included in the accreditation scope

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### 8 P-50 SLIDING DOORS. Sound Reduction Index



# **Doors for Health Buildings**

### 9 RADIOLOGIC DOORS. Isolation according UTPR regulation

Centre: Diagnostic Radiology Room Address: Madrid Room Conventional Date: 5th February 2014 Ref: 14CR.nr. 1 of 1



### FEATURES OF THE DOOR SUBJECT TO THE MEASURE

Manufacturer: Model: Shielding: Manusa P-50. Swing, of manual opening and closising 2 mm of Pb

### EQUIPMENT: CONVENTIONAL

### Measurement of radiation levels

| Measuring Equipment | nt Rolem Ram-Ion (500 cc)     |        |        |                        |  |  |
|---------------------|-------------------------------|--------|--------|------------------------|--|--|
| Centre              | Diagnostic Radiology Room     |        |        |                        |  |  |
| Room                | Conventional                  |        |        |                        |  |  |
| Date                | 5 <sup>th</sup> February 2014 |        |        |                        |  |  |
| Shooting technique  | 70 kV                         | 64 mAs | 110 cm | 20 cm H <sub>2</sub> O |  |  |
| Workload            | 80 mA min / week              |        |        |                        |  |  |

### Results

| Measuring point                           | µSv/h | mSv/mA min | U | т | Weekly dose | Dose<br>annual | % Annual Dose<br>Limit |
|---|-------|------------|---|---|-------------|----------------|------------------------|
| Room Interior / In front of<br>lead glass | 849   | N/A        | 1 | 1 | N/A         | N/A            | N/A                    |
| Lead glass                                | 0.0   | 0.0        | 1 | 1 | Depth       | 0.0            | 0.0                    |
| Door seals                                | 0.0   | 0.0        | 1 | 1 | Depth       | 0.0            | 0.0                    |
| Behind the door                           | 0.0   | 0.0        | 1 | 1 | Depth       | 0.0            | 0.0                    |
| Door frames                               | 0.0   | 0.0        | 1 | 1 | Depth       | 0.0            | 0.0                    |
| Door to floor seal                        | 0.0   | 0.0        | 1 | 1 | Depth       | 0.0            | 0.0                    |

### \*(N/A): Not Applicable

### Comments:

With the results obtained, it is estimated that the annual dose limits, both for the Professionally Exposed Personnel and for the Members of the Public, are below the legally-established limits, and that there exists no radiation risk in the indicated points and under the measuring conditions given and collated in this document.

(BO **UnD** CALERUEGA 67 (Edil, Pina Leonardo Benitez U.T.P.R. Manager 3 M

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