

ENgineering
SOLutions for
Medical
Application

ONE STOP SOLUTION FROM SWITZERLAND

Developing & producing customized high-quality protection products, hermetic doors, windows and medical diagnostic equipments.

State of the art **Engineering Solutions** providing protection from radiation and contamination along the entire contour of the doors.

Special doors for Special Environment - radiation protection and hermetic doors to protect the medical personnel and patients.



30 Years
of Engineering
Experience



INDUSTRIES OF FOCUS:

- Healthcare (hospitals, oncology clinics and centers, radiology departments, operational theaters);
- Pharmaceuticals;
- Laboratories;
- Medical Devices;
- Nuclear Medicine;
- Food & Beverages;
- Cosmetic Production;
- Server Centers;
- Banking.

TYPES OF PRODUCTS

RADIATION PROTECTION SHIELDING:

- Heavy radiation protection doors;
- X-Ray protection doors;
- X-Ray protection windows and shutters;
- Mobile X-Ray protective shields;
- X-Ray radiation shielding screens.

HERMETIC DOORS AND WINDOWS FOR:

- Operational theaters;
- Clean rooms;
- Pass-through boxes for surgery rooms.

MEDICAL DIAGNOSTIC EQUIPMENT INCLUDING:

- X-Ray machines (fluorographs);
- LED X-Ray film viewers;
- X-Ray Film Drying Cabinets.

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All our products correspond to the applicable European Standards and Directives, especially the relevant provisions of the Machinery Directive 2006/42/EC and Directive 2014/30/EU on electromagnetic compatibility (EMC), EN ISO 12100:2020, EN 60204-1:2018, EN 16005:2013, ISO 14644, GMP.

RADIATION PROTECTION DOORS

Radiation shielding doors provide protection from gamma and neutron radiation.

We manufacture doors of different weights. The average weight of our radiation shielding door is between 500 kg and 10 tonnes.

The maximum weight of a radiation protective door that can be produced by Ensolma is 53 tonnes – but this is not the limit.

Aluminium, concrete, lead and/or boron polyethylene are used as protective materials, depending on radiation's type.



TYPES OF DOORS:

SLIDING:

- Hanging version from 200kg up to 2000kg;
- Floor – supported version – ensolma Folding Floor (eFF) – from 2000kg up to 50,000kg;
- Automatic folding floor or RP threshold;

SWING:

- Pneumatic actuators from 300kg;
- Electric actuators up to 300kg;
- Automatic rising RP or automatic falling RP threshold.

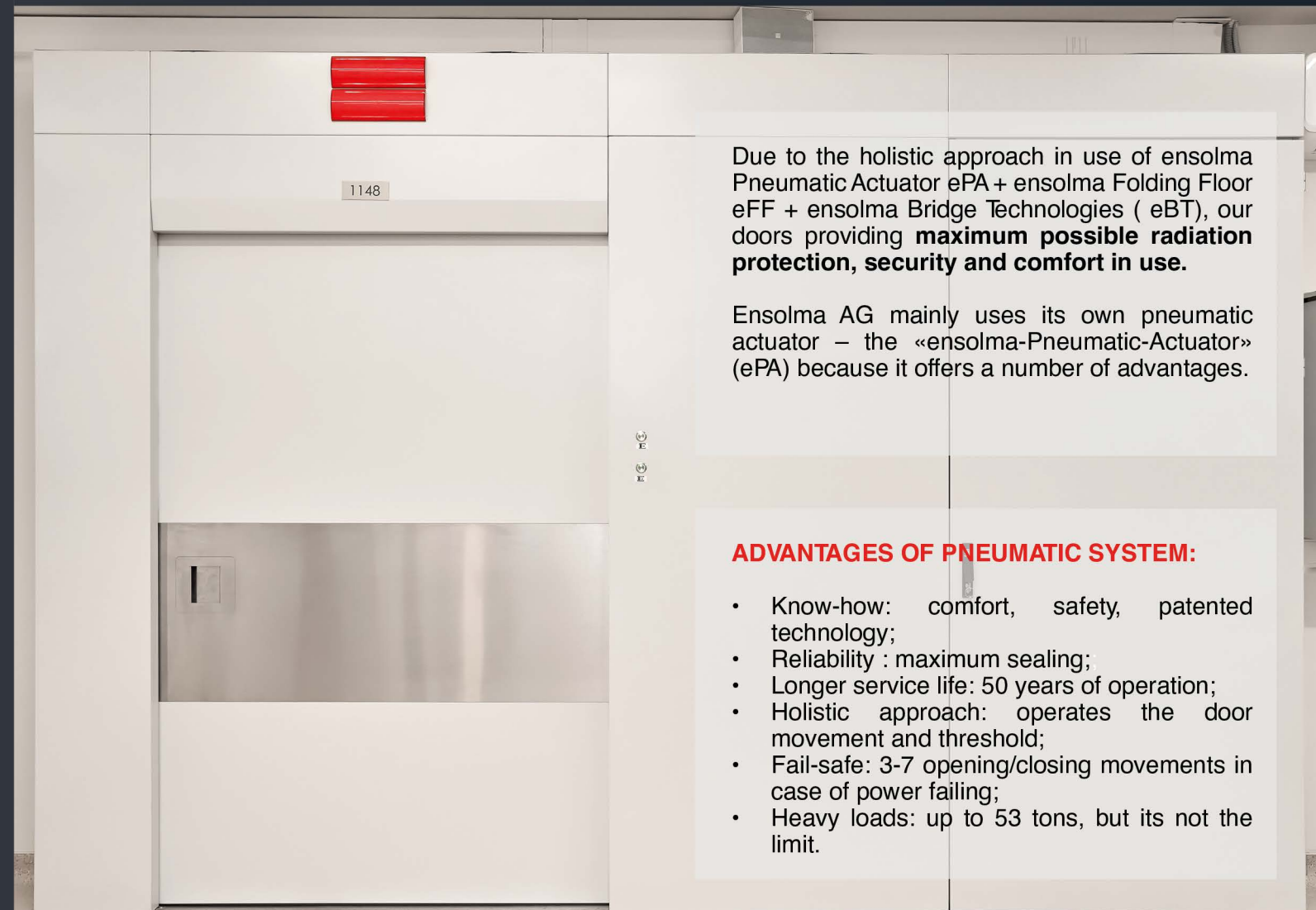


SECURITY AS A MATTER OF TRUST

- 3-Level protection system for safe operation;
- Anti-compression protection;
- Vertical IR sensing channel;
- Alarms from any of the security systems cause the leaf to stop and set the door to open;
- Optional: IR safety zone channel.

PNEUMATIC ACTUATOR (ePA)

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Due to the holistic approach in use of ensolma Pneumatic Actuator ePA + ensolma Folding Floor eFF + ensolma Bridge Technologies (eBT), our doors providing **maximum possible radiation protection, security and comfort in use.**

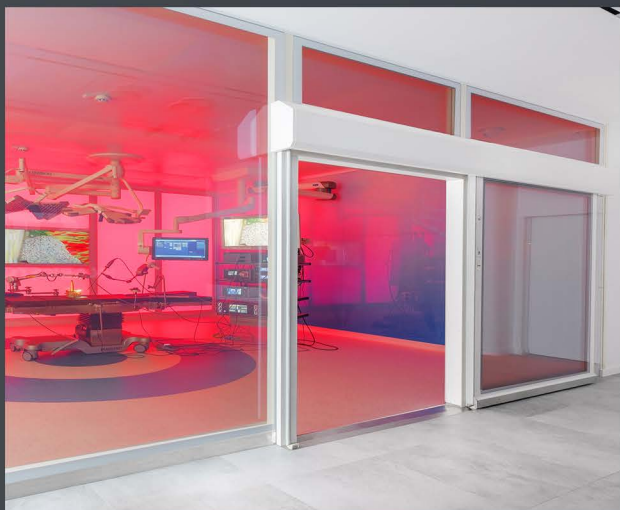
Ensolma AG mainly uses its own pneumatic actuator – the «ensolma-Pneumatic-Actuator» (ePA) because it offers a number of advantages.

ADVANTAGES OF PNEUMATIC SYSTEM:

- Know-how: comfort, safety, patented technology;
- Reliability : maximum sealing;
- Longer service life: 50 years of operation;
- Holistic approach: operates the door movement and threshold;
- Fail-safe: 3-7 opening/closing movements in case of power failing;
- Heavy loads: up to 53 tons, but its not the limit.

HERMETIC DOORS

FOR OPERATIONAL THEATERS & CLEAN ROOMS



Ensolma offers a wide range of door systems that ensure the highest levels of security and protection for the operational theaters, laboratories, and production spaces according to ISO 14644 and GMP.

The **Patent** Ensolma sealing system provides the highest possible air- and gas tightness for the clean rooms.

TYPES OF DOORS:

SLIDING:

- Automatic;
- Pneumatic.

SWING:

- Manual;
- Electric.

PERFECTION IN THE NUANCES:

- “Ensolma pneumatic actuator” (ePA);
- «Ensolma dancing technology» (eDT) – sliding version;
- «Ensolma bridge technology» (eBT) – swing version;
- «Ensolma hermetic sealing solutions» (eHSS);
- «Smart Glass» for door and windows;
- Antibacterial surface.

TYPES OF CONTROLS:

- Push-buttons;
- Magnetic card readers;
- Elbow buttons;
- Non-contact ultra small field IR sensors.



SPECIAL FEATURES:

- Wide range of design;
- With or without inspection windows;
- Double glazed window;
- No use of clamping frames;
- Completely flat door leaves;
- Stainless steel kick plate fixed into the door leaf;
- Partial opening option.

«SMART GLASS»

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Ensolma «Smart Glass» is a dynamic glass, allowing a traditionally static material to become alive and multifunctional. Our «Smart Glass» goes from opaque to transparent when voltage is applied and thereby controls the amount of light that can be transmitted. This makes a great window treatment inside healthcare facilities since it is like having blinds built into the glass.

KEY ADVANTAGES:

- Serves as an excellent alternative to blinds;
- Reduces heat loss and cuts air conditioning and lighting costs;
- Creates nice design and comfort in use;
- «Smart Glass» = Safety glass, a barrier against forced entry;
- Improves energy efficiency by blocking UV and IR light.



PASS THROUGH BOXES

Pass-through boxes can be produced in **two versions**:

- Passive - simple boxes with the hermetic doors on both sides;
- Active – boxes with HEPA-filtered ventilation and pressure compensation for overpressures from +15 Pa up to +60 Pa.

Both versions are manufactured in accordance with the ISO 14644-7 standard.

KEY FEATURES

- Casing material - steel, powder-coated;
- Material of lining internal surfaces – brushed stainless steel AISI 304;
- Installed HEPA class H14 filters installed (active version);
- Electromagnetic locks for doors;
- Maximum pressure drop of each door up to 100 Pa;
- Indicator of pressure in the internal volume.

P.S. can be individually adapted to all requirements.



X-RAY DOORS

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Ensolma door systems are the right solution for applications requiring protection against X-ray radiation, such as hospitals, medical practices, laboratories, industry and airports.

Our doors comply with DIN 6834-1:2012.

TYPES OF DOORS:

- Swing;
- Sliding.

2 TYPES OF SLIDING:

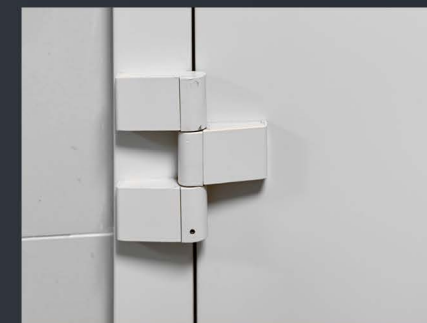
- Sliding simple door;
- Sliding door with a box.

X-Ray protection swing doors and sliding doors are made of metal with cellulose honeycomb panel filling.

Leaded sheet metal is used as the X-Ray protection material. The structures provide an X-Ray attenuation range equivalent to 0.5 - 3.5 mmPb.

X-Ray protection doors can be operated manually or electrically.

The weight of the door elements depends on the size and the lead equivalent. It varies between 80 and 250 kg.



TYPES OF DOOR FRAME:

- Corridor frame;
- Control room frame.

TYPES OF HINGES:

- The overhead hinges with integrated needle bearings;
- The welded hinges.

X-RAY MACHINES FLUOROGRAPHY

Ensolma offers **three types** of X-Ray machines:

- Tripod version;
- Cabin version;
- Mobile fluorography cabinet.

Application - Very useful and highly recommended for mass preventive examinations of Tuberculosis screening.

IMPORTANT:

- Provides images of the chest organs of vertically positioned patients in the forward and/or lateral projections;
- Minimum possible radiation load;
- Production of at least 60 examinations per hour;
- Digital X-Ray receiver;
- Automated workplace of X-Ray lab technician;
- Ensolma Fluoro-Alpha software has the simplest possible user interface;
- High European Quality with low Cost (commercial and operational).

CABIN VERSION

- No need for the additional X-Ray protection in the room;
- Can be in a mobile version on the truck/bus;
- Electromechanical drive of door opening/closing with automatic control;
- Patient movement on the lift stand (up and down);
- Optional: removable bench stand for children's scan;
- Optional: a bacterial lamp for air disinfection.



What is the mobile fluorography cabinet? It is an autonomous mobile medical complex that can be operated in tough climatic and geographical conditions, providing a high level of comfort for medical personnel and patients.

X-RAY PROTECTION SHIELDS

Mobile X-Ray protection shields are designed to protect medical personnel from scattered X-Rays when conducting X-Ray diagnostic studies. Ensolma produces **different types of shields** and screens with and without window:

- Single compartment shields;
- Two-pieces shields;
- Three-pieces shields.

The standard shielding protection is Pb 1,0. On request can be produced 1,5 mm and 2,0mm.

There is a wide range of colours and the possibility of painting different sides of the products.

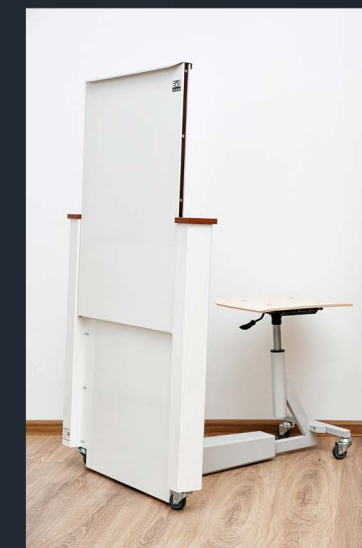


PS: can be applied in dental X-Ray, Veterinary X-Ray, Accident & AMP, Emergency Departments, as well as in industrial usage.

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SPECIFICS:

- Elegant flat and stable design;
- Easy and safe to use;
- 95% of the materials used are recyclable;
- Wide range of lead and protective materials;
- Full flexibility in the use of protective glass;
- Reliability and service life;
- Price / Quality ratio.



MATERIALS USED IN THE CONSTRUCTION:

- Steel;
- Metal sheet lead;
- Cellulose;
- Glass;
- Minor amounts of polymeric materials.

X-RAY FILM DRY CABINET

Designed for drying X-Ray film after its photochemical treatment. Drying is carried out by blowing warm air into the cabinet chamber.

Consists of a chamber with a fan and two retractable shelves for X-Ray films. Each shelf can hold up to 10 films fixed in special frames.

The drying process can be observed through a glass door. Equipped with an automatic thermostat, maintaining a certain temperature required for drying the film.



KEY FIGURES:

- Drying framed X-Ray films of all sizes;
- Capacity of 20 films;
- Recuperative Thermal Scheme;
- Single passage of hot dry air at 50°C;
- Reduction of film drying time to 30 min. on upper shelf and 40 min. on lower shelf;
- Powder Coated Surfaces;
- Price – Quality Ratio.

X-RAY LED FILM VIEWERS

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Ensolma X-Ray LED film viewers are characterised by a modern design and high quality as well as durability.

Brightness of the screen of negatoscopes has smooth adjustment in the range from 10 to 100%.

Some types can be used for the dense X-Ray images (f.ex. for viewing mammograms).

The negatoscope body is made of sheet metal. Light source - LED lines.

Milky-white screen installed in the housing is made of plexiglass.



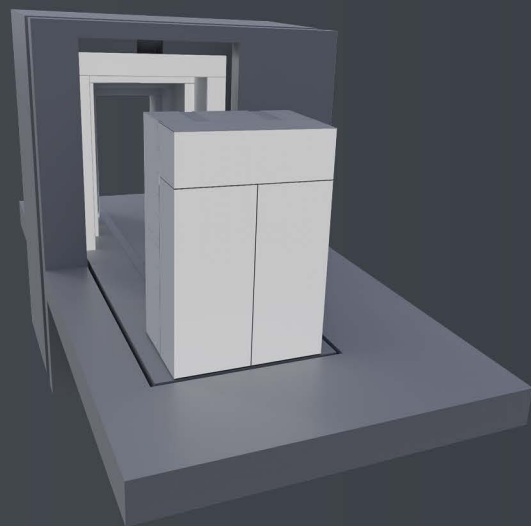
KEY FEATURES:

- «Ensolma super brightness» – eSB;
- Slim design;
- 12 Models of different sizes and colors;
- Self Standing or Wall Mount;
- Price – Performance Ratio.

ENGINEERING SOLUTIONS

PROJECT: THE RADIATION-PROTECTION DOOR TYPE "PLUG"

- Made of monolithic heavy concrete with a density of 2.3 t/m³ ;
- Concrete mix composition is a specially developed "in-house";
- The monolithic leaf is supported by movable blocks that run on linear guides;
- The load is distributed equally by the installation of disc springs;
- Open channels are overlapped by the "ensolma automatically folding floor";
- Important: the folding floor remains stationary in the open part while the door leaf moves;
- Use of "ensolma pneumatic actuator" (ePA);
- The door is equipped with the anti-squeeze protection system.



PROJECT AIRLOCK DOOR

- The hermetic doors with a unique airlock allow a pressure drop of 2000Pa;
- Thanks to this solution, people are enabling to fly in a wind tunnel at air speeds of up to 300 km/h;
- They enjoy a unique experience that depends on Ensolma's airtight seal being 100% tight.

Indeed, we are perfectly capable of meeting even higher requirements.

ONE STOP SOLUTION FROM SWITZERLAND

Ensolma AG was founded in Switzerland to develop and produce customized high-quality radiation protection products, hermetically sealed doors, windows, and the medical diagnostic equipment.

Our products bring a lot of features that are unique, based on great knowledge and experience. They designed to meet the highest standards of reliability, durability, and hygiene.

Every door is a unique project, where we strive to perfect every detail, surprise customers with a quality and meet their highest requirements.

When it comes to radiation safety, it is the maximum; when it comes to clean room tightness, it is almost perfect for staff and patients.



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We like to surprise our customers with results that exceed their expectations.

We enjoy solving complex problems that are too difficult for others.

We like to realise concepts that exist in sketches or in the client's imagination.

Ensolma doors are open for the ideas and dreams of customers to bring it to reality.

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