DensXspect®

X-ray spectroscopic material tester

Description

DensXspect® is a system for measuring the absolute density and elemental composition of solid materials or products with even complex shapes. It is based on the property of X-rays to penetrate materials contactless and undergo a change in function of the material passed through.
DensXspect® uses the transmission technique: the material under examination must be crossed by X-rays.

The sensor receiving the X-ray beam thus modified is able to detect the resulting spectrum: the real-time analysis of this spectrum allows to determine which elements make up the material under consideration and in what percentage. The X-ray generator is a very low power device: it delivers a continuous flux of X photons with a diameter of only 500 µm. The low power and the small size of the beam allow compliance with safety standards: at a distance of one meter from the system, at the maximum power that can be supplied, the radiation level is well below the safety legal limit (<0.2 µSv / hour at 1 meter in any point easily reachable from the external surface of the appliance).

The sensor consists of a Cadmium-Zinc-Telluride (CZT) semiconductor element and a high-speed signal reading electronics capable of capturing both the quantity of photons and their energy, grouping them into homogeneous categories. The subsequent analysis with artificial intelligence algorithms allows the univocal definition of the “Fingerprint”, a set of information that correctly identifies the elements contained in the product under test. This information is transmitted over the Ethernet port for any further elaboration by the user.

Features and Benefit

- Spectroscopic sensor of the latest generation (CZT)
- Easily inspected and adjustable sensor
- Detection of elemental components in real time
- Absolute density calculation in real time
- Calculation of % composition in real time
- Data transmission over Ethernet port
- Automatic machine status and safety management
- Mechanical “C” design for simple integration on field
- Integrated power and control electrical panel
- LEDs for visual information of machine statuses

MADE IN ITALY

Contact
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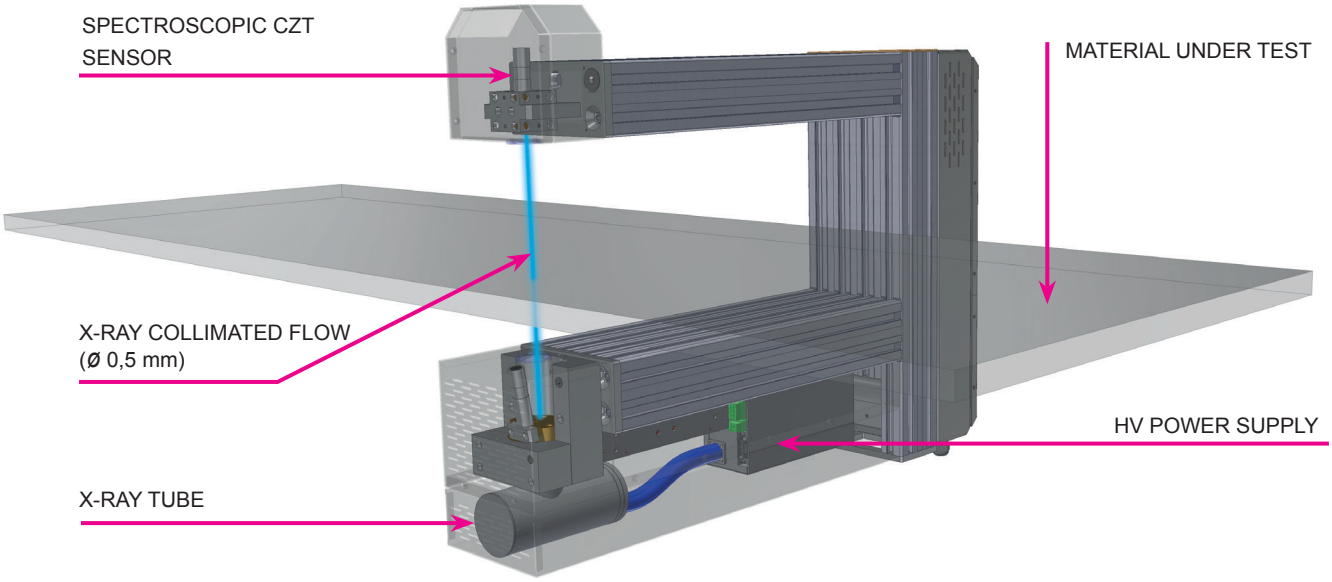
W W W . D U E 2 L A B . C O M

Functional description

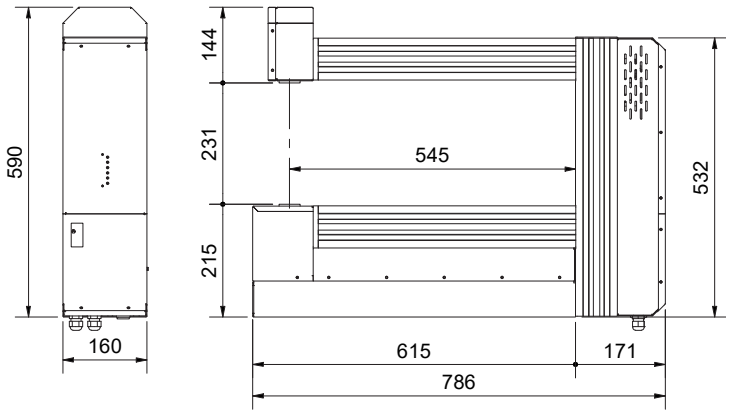
When switched on, DensXspect® performs a series of checks and goes in a state awaiting the command (by user) for functional enabling: X-ray scanning occurs only when this command is active. When enabled DensXspect® analyzes the material in real time and outputs the information over Ethernet line through a simple communication protocol.

All control of the system can be done through the commands of the Ethernet protocol.
The DensXspect® contactless scanning system should preferably be assembled and fixed using the vertical structure which also contains the electrical panel.
The two arms that contain the X-ray emitter on one side and the receiving sensor on the other must, in use, be kept free from mechanical vibrations. It is also preferable to mount vertically as illustrated, because it facilitates accessibility to the various parts. The air cooling of the DensXspect® takes place with the closed module, with filters, contained below the switchboard: in case the working ambient temperature is higher than 40 ° C, it is mandatory to cool down the incoming air flow.



Dimension

Heigth:	590 mm
Length:	786 mm
Width:	160 mm



Technical specifications

Sensor type:	CdZnTe
Dimension CdZnTe:	mm 2 x 2
Reading area:	mm^2 0.2
Body sensor dimension:	diam 20 mm x 80 mm
Sensor body:	shielded aluminum
X-ray flow length:	mm 230 (material useful clearance)
X-ray power, max:	50 W
Energy level, max:	30 keV
Cooling:	forced air
Working temperature:	max 40°C ambient
Power:	230V 50/60 Hz, 0.5 kVA

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