

Laboratory Density Profile Analyzer

DENSE-LAB X / ... also as „light“-Version

An ideal density profile is essential in the production of quality wood based panels.

Beside quality assurance, expensive over-dimensioning can be avoided.

The laboratory density profile measuring system DENSE-LAB X determines the density distribution over the sample thickness (perpendicular to the panel surface) on small samples with the usual dimension of 50 x 50 mm². The measurement is non-destructive and non-contact using X-ray technology.



A key point to understand about the technology of Density Profile Systems for laboratories: They are alike and not alike.

Nearly all of today's Laboratory Analyzers use the same technology, which is x-ray technology. Also the measuring principle employed is the same. What are the special features which make the DENSE-LAB X different from other equipment on the market? Answer: Low x-ray energy, long life time of the x-ray tube and ease of use. A point to consider is that the DENSE-LAB X is the unit of choice for numerous institutes, universities and R&D labs, and usage by many students and scientists from these institutions over many years has proven to be very positive.

The density profile of wood-based panels is a key quality characteristic for panel manufacturers and laboratories (R&D). The density profile is related to nearly all panel properties and it is influenced by numerous properties of the material and even the conditions of the manufacturing process.

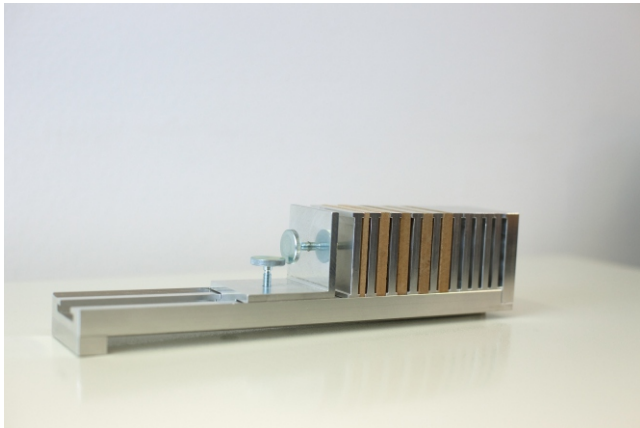
Typical density profiles are characterized by pronounced density maxima in the cover layers, a homogeneous region in the middle layer, and a smooth transition therebetween. In addition to such ordinary measurements on MDF, chipboard and OSB, most other wood-based materials such as plywood or LVL but also solid wood, sandwich panels and modern composites can be examined. Wood fibre insulating materials also have a pronounced density profile, which is important for their later use. For this special panel types with low densities, an adapted variant, a "light" version, was developed (DENSE-LAB X light).

In terms of quality assurance, the DENSE-LAB X laboratory instrument provides important information for process optimization and allows to calculate the mean density of a sanded panel. In R&D divisions the reliable measurement results of the DENSE-LAB X make a significant contribution to the evaluation of material developments or raw material and process optimization. Measurement data are clearly displayed and compactly stored, can be integrated into customer-specific quality assurance systems and are available for external further processing in an independent format.

Technical Data

	DENSE-LAB X	DENSE-LAB X <i>light</i>
Technology:	X-ray	
Anode current:	0.2 mA	0.5 mA
High voltage:	50 kV	20 kV
X-ray power:	10 W (no active cooling required)	
Range (row density): (wood, plastics)	300 – 1500 kg/m ³ [19 – 94 lbs/ft ³] (higher densities and different material on request)	50 – 350 kg/m ³ [3 – 22 lbs/ft ³]
Geometric Resolution:	10 – 100 µm [0.00039 – 0.0039"]	
Measuring speed:	0.03 – 1.0 mm/s [0.001 – 0.04"]	
Resolution of Measuring Value: (depending measuring speed and geometric resolution)	+/- 0.5 % of measuring value (at medium measuring speed and 50 µm increment)	+/- 1.0 % of measuring value (at medium measuring speed and 50 µm increment)
Sample holder:	max. 12 per per measuring process (up to 220mm [8.7"] total thickness of panel samples)	
Dimensions: (W x D x H, weight)	804 x 705 x 240mm , 45 kg [32 x 28 x 10 inch , 99.2 lbs] (without PC)	
Power:	230 / 115 VAC	

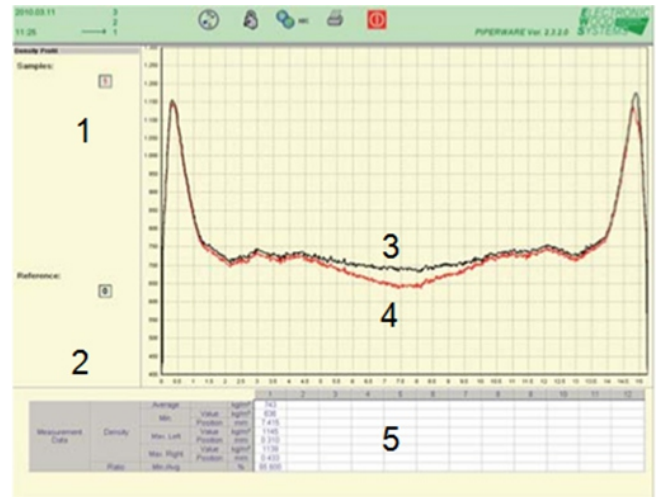
Features	Benefits
X-ray system with low X-ray tube power, sensitive detector, and fine measurement geometry	Extended life of the X-ray tube. High-resolution measurement of fine density structures over a wide measuring range at high resolution
Optimized X-ray measurement conditions due to predefined radiation properties	Precise and reliable measurement of the density profile based on self-calibration (automatically per sample)
Variant DENSELAB X <i>light</i> with adapted radiation properties	For materials with very low densities (such as insulating materials) with high accuracy
“Run-in Mode“ (slow and controlled increase of high voltage during start of system)	Extended life time of x-ray tube
“Sleeping Mode“ / “Energy Saving Mode“ (If the system is not in use the high voltage power is decreased by 90%).	Extended life time of the x-ray tube and energy saving
Measurement with different resolutions for top and core layers	Much faster measurement, because of possibility to increase measuring speed of core layer
Deposit of “Reference Profile“ (Comparison of all measurements with the “Reference Profile“)	Quality assurance and quick evaluation of the measurement results
Calculation of mean density by entering the panel thickness after sanding	Quality assurance and process optimization
Display of a tolerance range (tolerance area) around the diagram (see screen print on page No. 7, see bright red area).	Quality assurance



Sample holder

Evaluation

- Average density
- Maximum and minimum values
- Average values
- Location of sanding level
- Detail analysis by zoom function
- Comparison of profiles by overlay function
- Long-term history files



1. Sample No.
2. Reference No.
3. Reference profile
4. Measured density profile
5. Data interpretation table

Remote Control

Technical assistance is available by "EWS Online Support".

Accessories

- Weight scale with interface for direct data transfer to DENSE-LAB X
- Digital caliper with interface for direct data transfer to DENSE-LAB X

See YouTube: **DENSE-LAB X**

