ADVANTEST

Photoacoustic Microscope

Sales of this product have ended.

Hadatomo™ WEL5100

A New Tool for Non-Invasive Imaging of Blood Vessels in the Dermis to a Depth of 3mm

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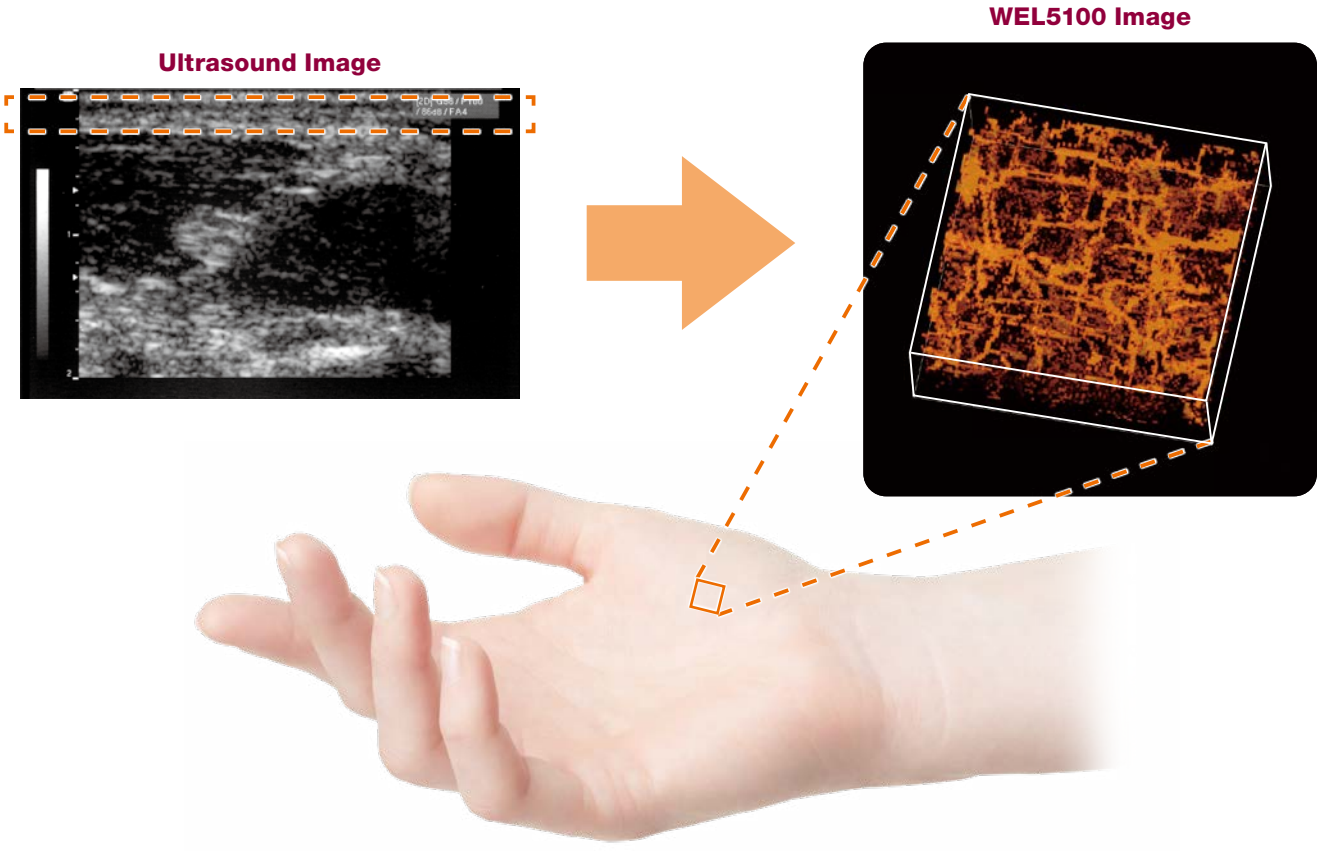
Noninvasive, High Contrast Imaging of Blood Vessels to a Depth of 3mm



New Hybrid Imaging Method Combines Advantages of Optical & Ultrasound Technologies

Existing ultrasound technology can noninvasively provide images of tissue structures by contrasting the relative hardness of constituent areas. However, it is inadequate to image areas within the dermis, where little hardness contrast exists.

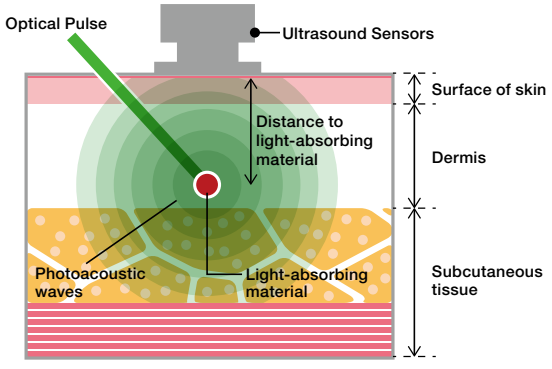
Conversely, optical imaging tools such as microscopes cannot "see" even 1mm beneath the skin.

Advantest's new photoacoustic microscope combines the propagation characteristics of ultrasound and the absorption characteristics of light into a new hybrid imaging method. By using ultrasound technology, it can obtain accurate information to a depth of several millimeters: Hemoglobin selectively absorbs the energy of pulsed light and returns ultrasonic waves to the surface of the skin, where they can be captured by sensors. Based on how long it takes for the waves to return, the depth of the target can be accurately measured and imaged.

The new Photoacoustic Microscope Hadatomo™ WEL5100 enables imaging of blood vessels within the dermis to a depth of 3mm. The differing absorptive characteristics of hemoglobin and tissue allow the target area to be selectively imaged in high contrast.

No Contrast Agent Required. Easy to Operate.

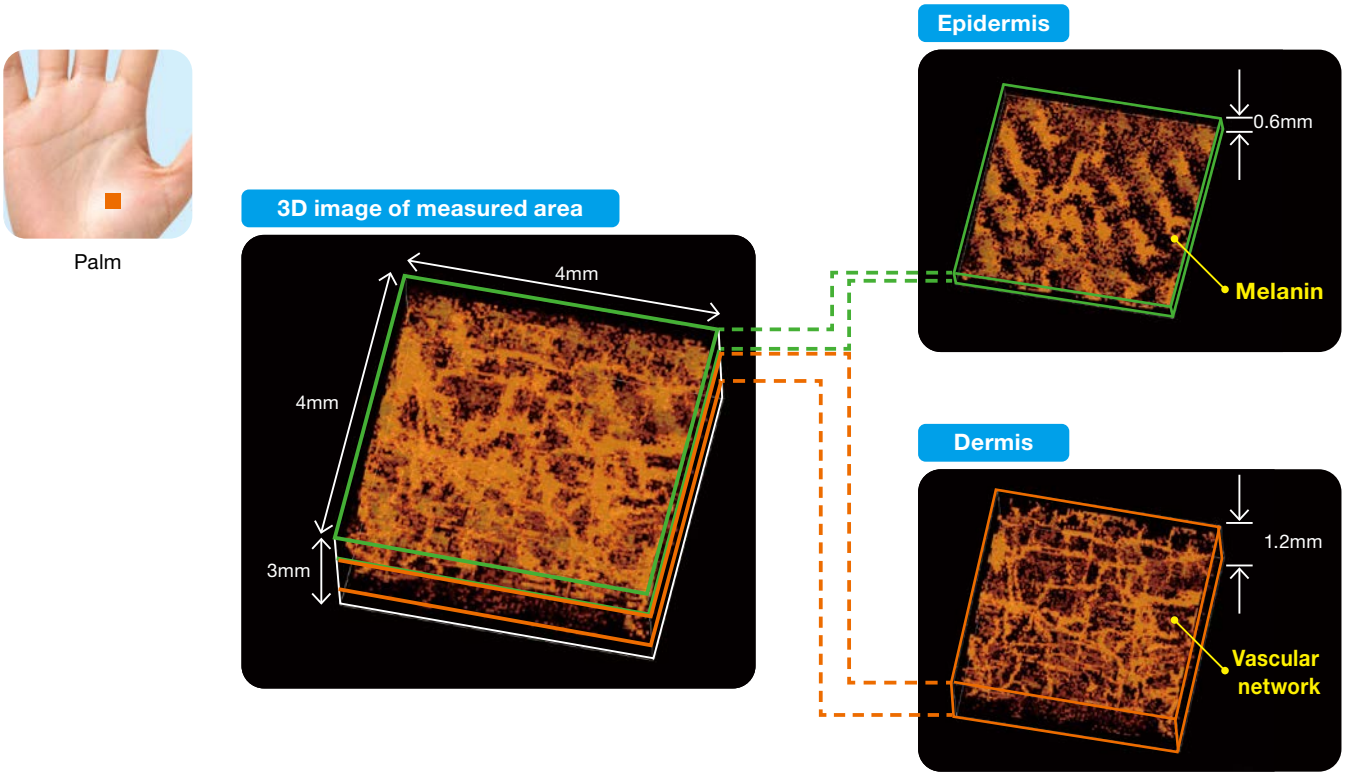
Label-Free:	No contrast agent required
Lens-Free:	Advantest's proprietary imaging algorithms make setup easy, with no optical lens or acoustic lens required.
Highly Sensitive:	The WEL5100's sensors are 10x more sensitive than conventional ultrasound tools. Advantest's circuit technology enables high-speed measurement for quick diagnoses.
Patient-Friendly:	The WEL5100 can perform measurements from any direction with a simple application of ultrasound gel or other coupling agent.



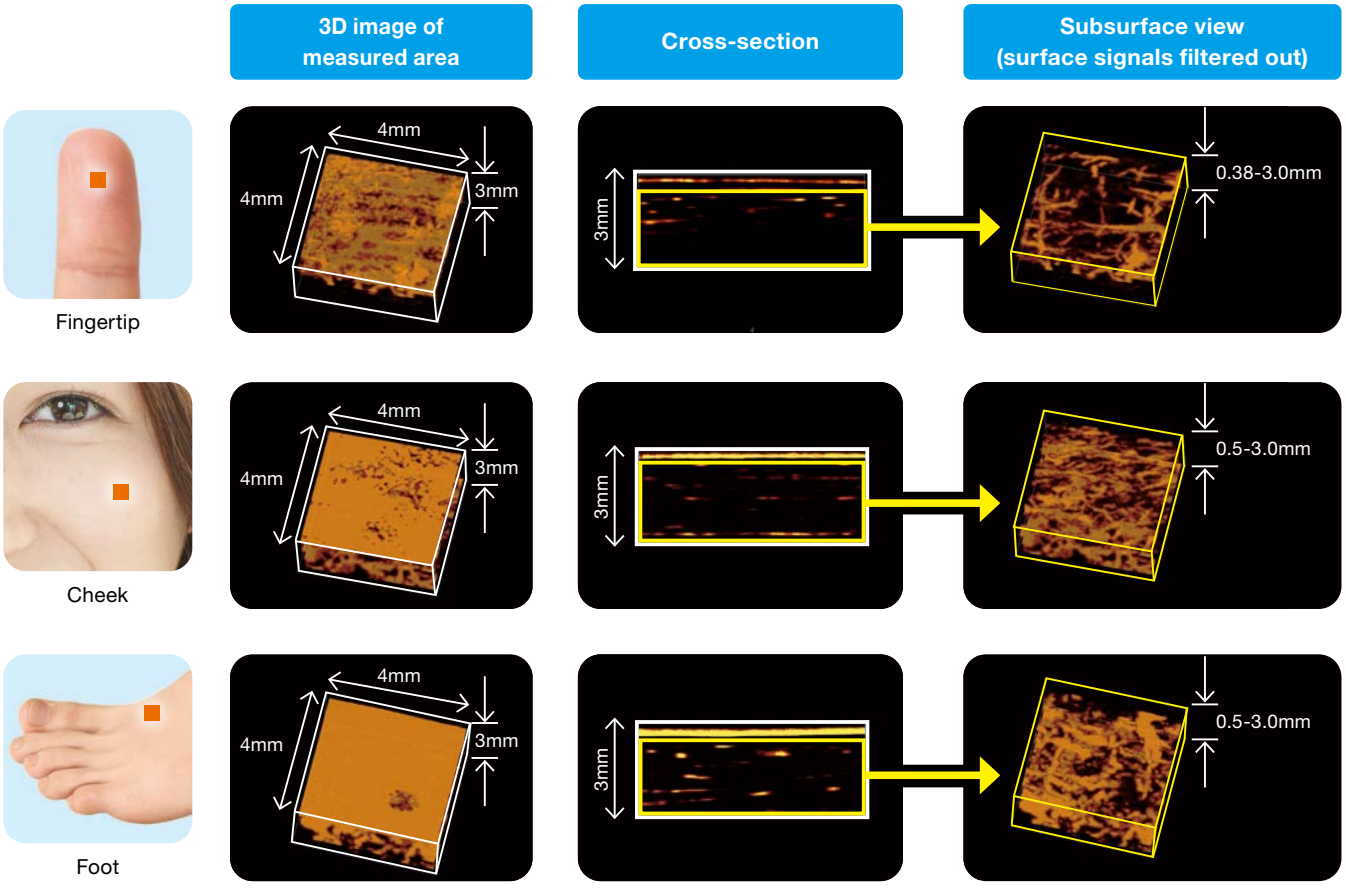
[The principle of Photoacoustic Imaging]

WEL5100 Imaging Examples

■ 3D image of a 4mm x 4mm x 3mm area of the palm, including the epidermis and dermis



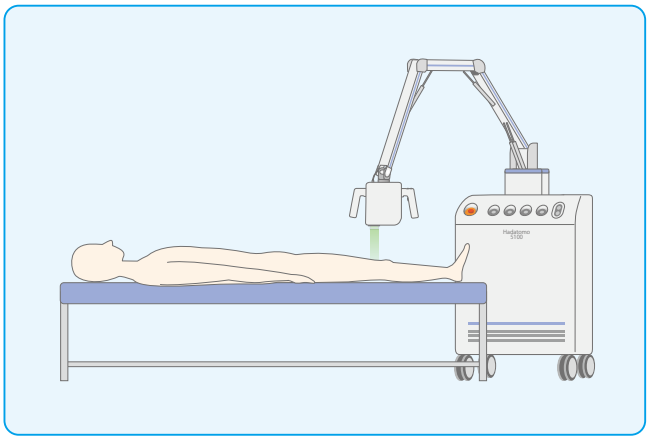
■ 3D images of 4mm x 4mm x 3mm areas of the fingertip, cheek, and foot, with cross-sections and subsurface views.

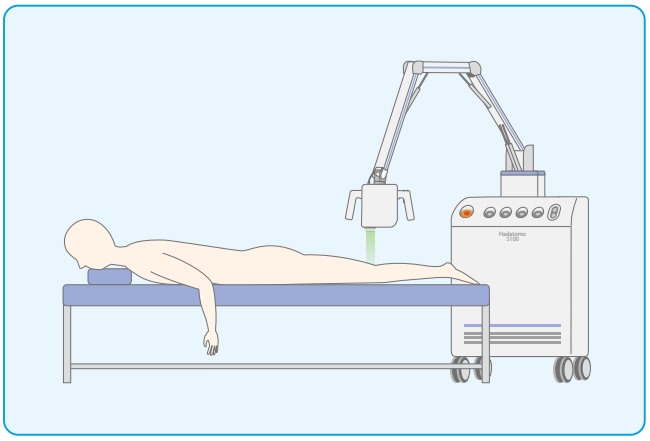


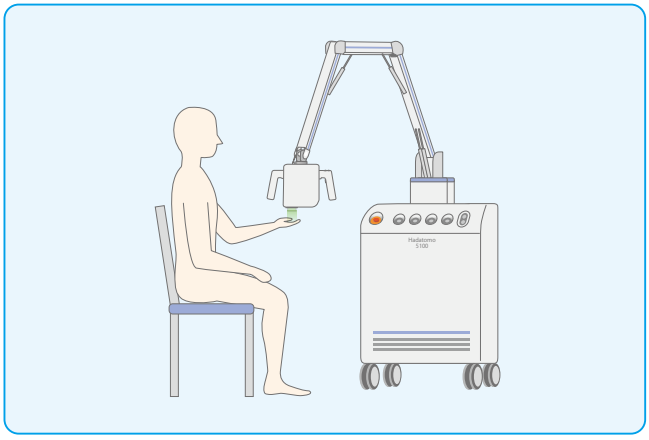
Product Features

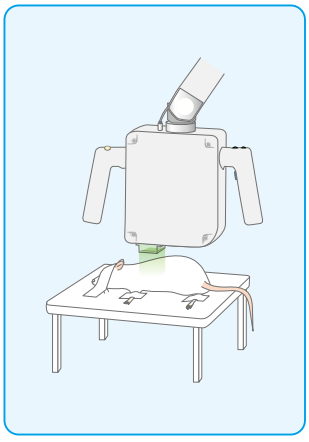
User-Friendly Configuration

Flexible arm enables measurement of patients in any posture or position.









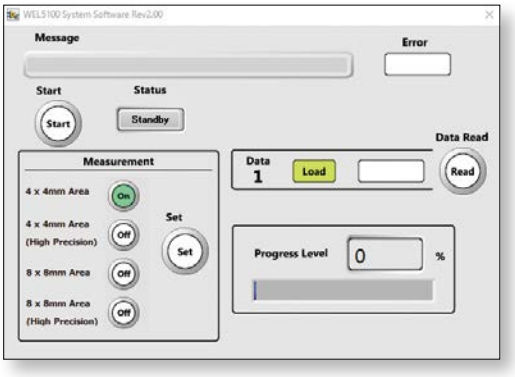
The Photoacoustic microscope Hadatomo™ WEL5100 features caster wheels that allow it to be freely positioned.

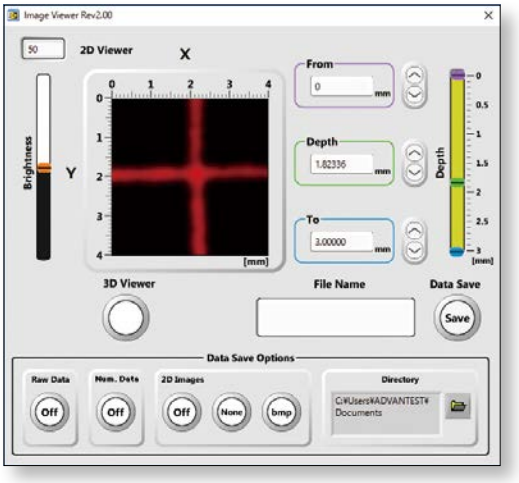
Minimum 20-Second Measurement Time

The Photoacoustic Microscope Hadatomo™ WEL5100 achieves high-speed measurements while remaining within the MPE(Maximum Permissible Exposure)parameters set under IEC60825-1:2014. An area of 4 mm× 4 mm× 3 mm depth can be measured in just 20 seconds, and an area of 8 mm× 8 mm×3 mm depth can be measured in 40 seconds.

Simple, Easy-to-Use Interface

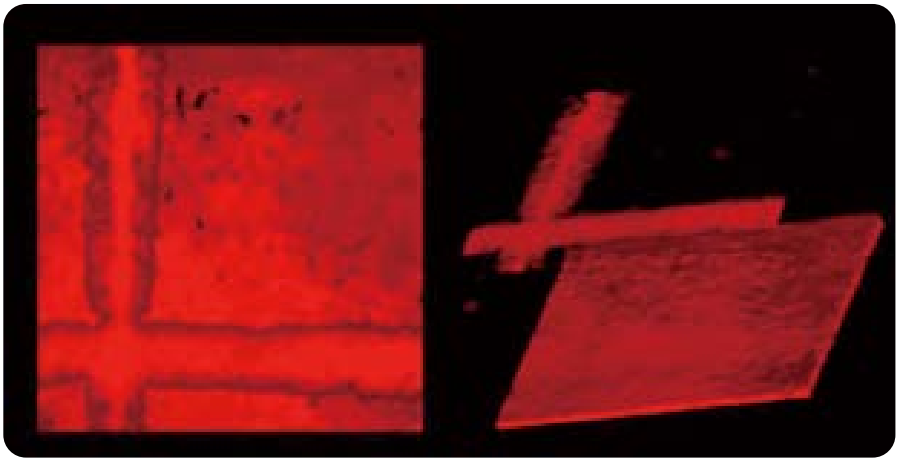
Graphics make the Hadatomo™ easy to operate.





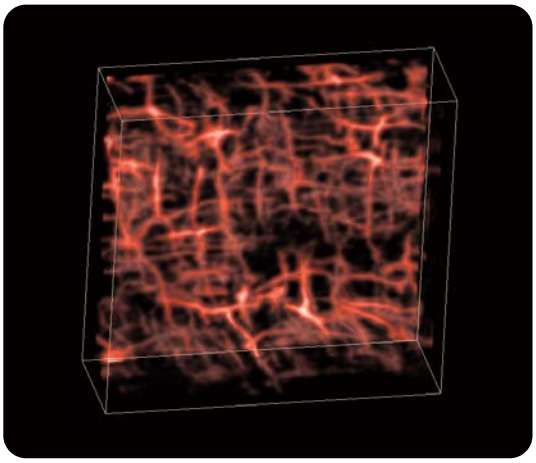
Displays Measurement Results Immediately as 2D / 3D Images

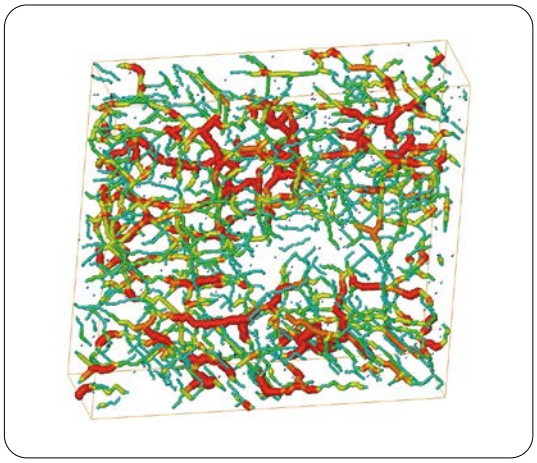
Measurement results can be easily and quickly displayed as 2D / 3D images, allowing for on-the-spot confirmation of measured data.



Clear Rendering of Saved Data With Analysis Software

Data is saved in 2D png and bitmap format, allowing users to render it using their preferred analysis software.

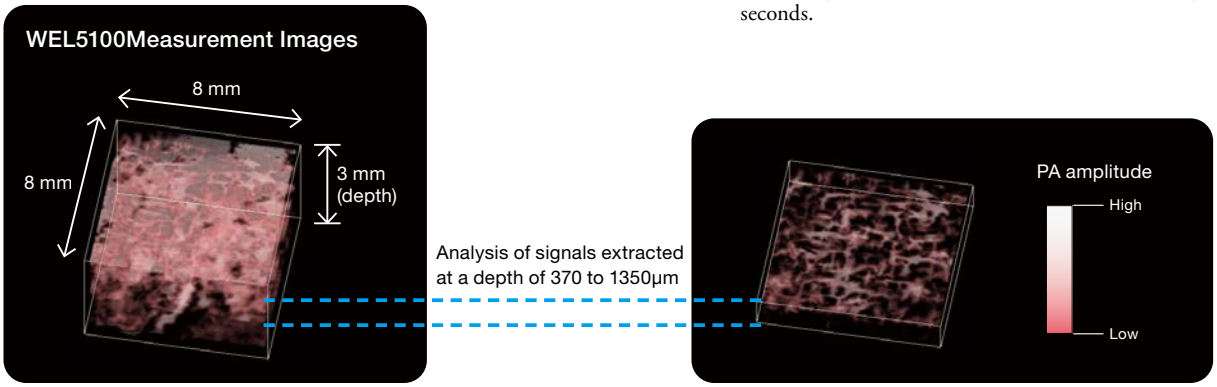




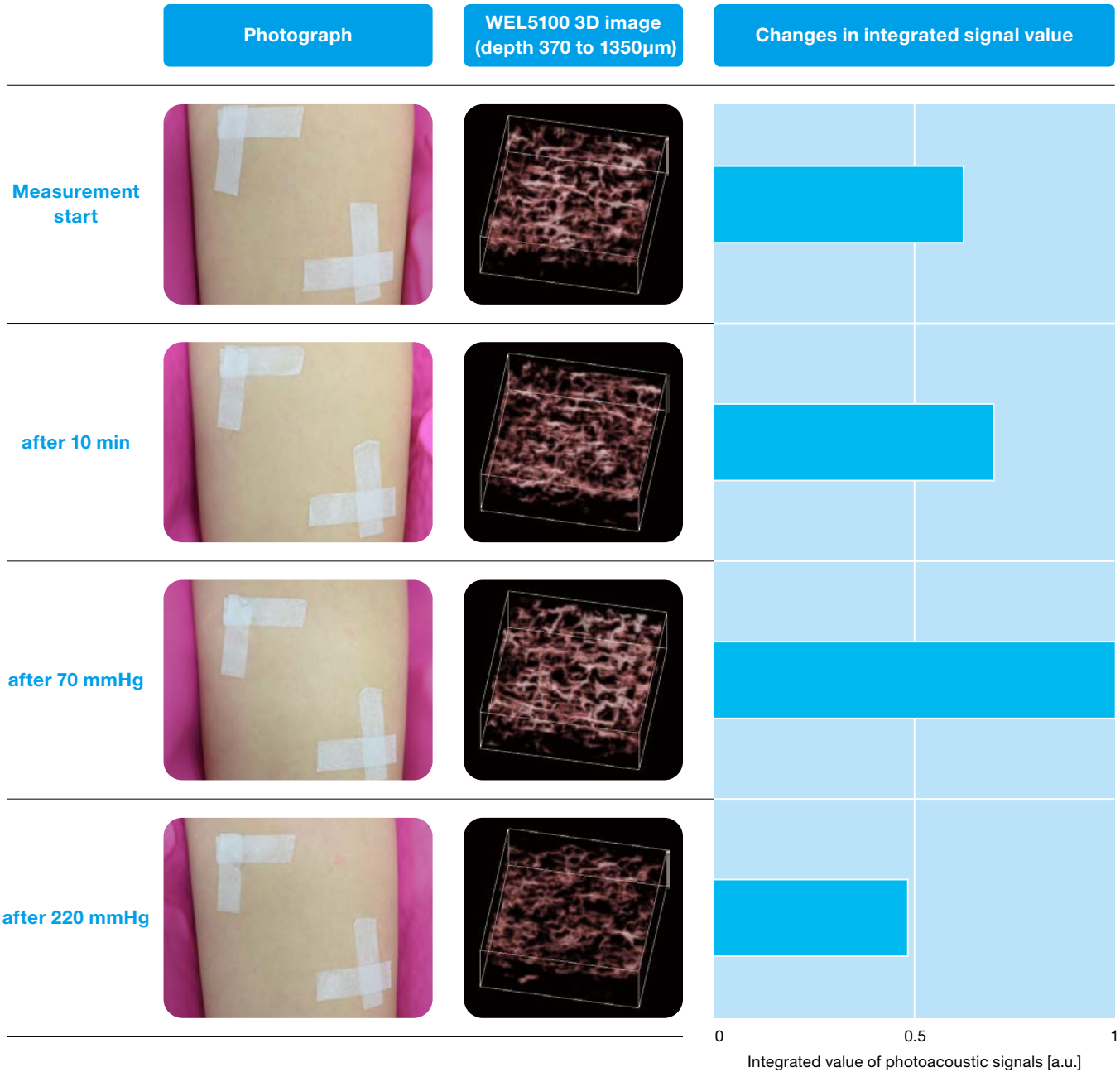
Case Study: measurement of blood circulation change in forearm after application of pressure

■ **Measurement area: inner forearm**

Measurement method: We used the Hadatomo photoacoustic microscope to measure Photoacoustic(PA) signals originating from blood previous to applying pressure with a cuff, and 10 minutes afterwards. The cuff applied 70 mmHg pressure for 30 seconds, and 220 mmHg pressure for 30 seconds.



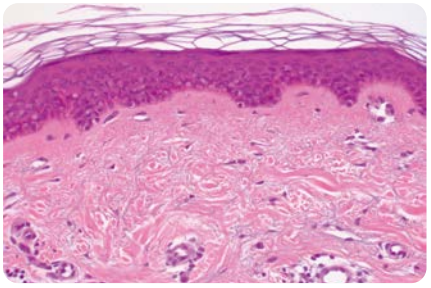
Measurement Results



Suggested Applications

Analyze progress of skin grafts in plastic surgery procedures

Diagnose condition of blood circulation in peripheral artery disease patients and others



Check regrowth of blood vessels in cultured tissues in regenerative medicine procedures

AGA research into hair regrowth and scalp blood circulation

Research into the efficacy of percutaneous absorption type medications and other drug delivery systems

Diagnose efficacy of cosmetics and skin care products

Product Specifications

Model Name	WEL5100
Wavelength	532 nm
Pulse Length	< 2 ns
Optical Energy	< 100 μJ/pulse *1

Measurement Time	20 s / 40 s / 80 s / 160 s
Measurement Area	4 × 4 × 3(depth)mm / 8 × 8 × 3(depth)mm
Dimensions	Approx. 540(W) × 545(D) × 1546(H) mm
Weight	< 110 kg

*1:Optical (irradiation) energy is constant, but repetition frequency may vary depending on measurement conditions.

- The Hadatomo™ is a Class 3B laser instrument.
- The Hadatomo™ is a scientific instrument. It is not approved for use in medical diagnoses.
- The specifications and images in this catalog are subject to change without prior notice.

ADVANTEST®

http://www.advantest.com

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