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Inspire the Next

# prosound F75 PREMIER CV



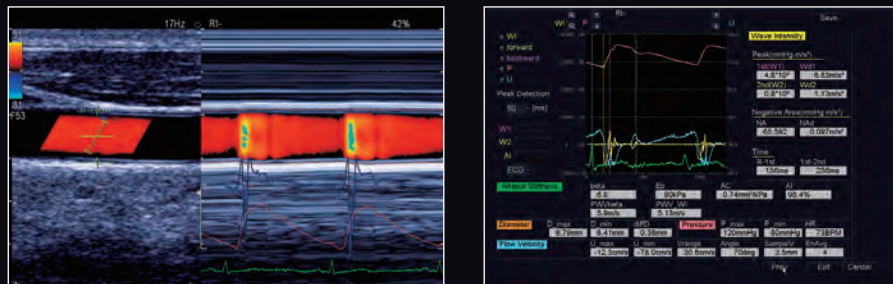
# FIT to your specialty

Cardiovascular ultrasound entering another phase.

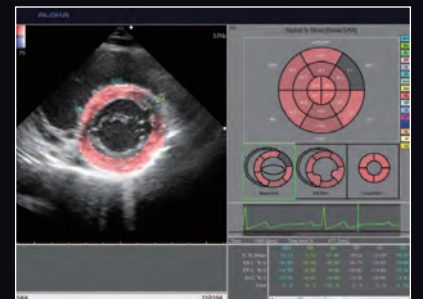
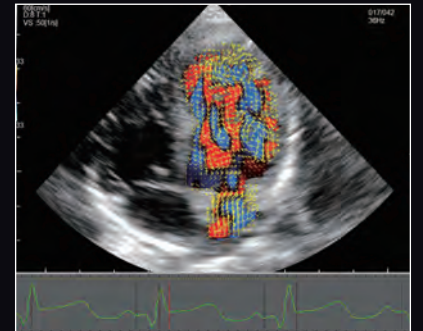
What is the role of ultrasound in cardiovascular disease?

The ProSound F75 Premier CV has been developed with this basic question in mind. Designed with well thought-out specifications and usability for both routine examinations and for advanced research, the ProSound F75 Premier CV has been developed to fulfill all cardiovascular specialty requirements.

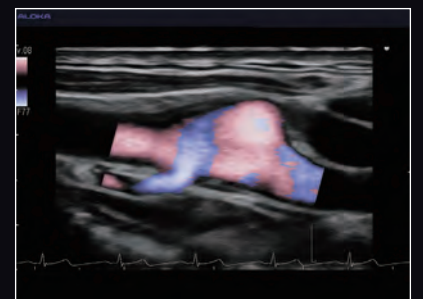
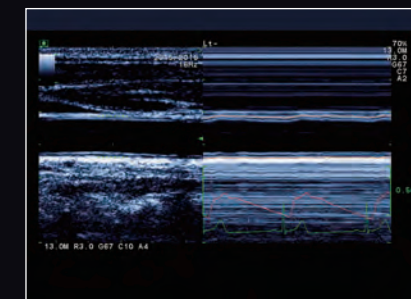
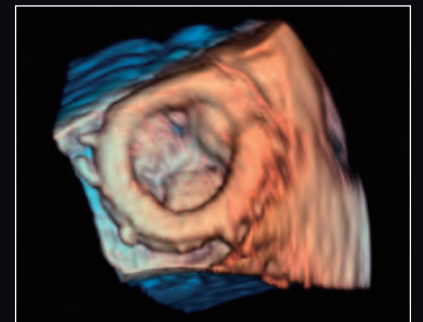
## ■ Simultaneous evaluation of the heart and blood vessels



## ■ Evaluation of cardiac motion and blood flow



## ■ Evaluation of blood vessel elasticity and function



# Cardiovascular Imaging Clearly Defined



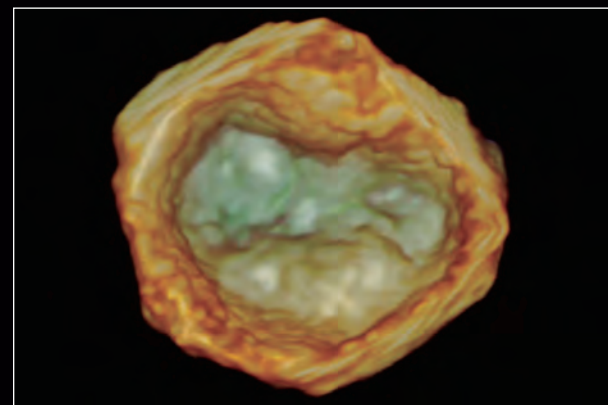
# Cardiac 3D Clearly Defined

## Examine cardiac morphology with higher accuracy

Three-dimensional observation of the heart not only allows an objective evaluation of cardiac pathology based on anatomical information, but can also provide information critical for surgical treatment. Dynamic Volume Processing is dedicated to 3D transesophageal echocardiography (TEE) reconstructing images with ease.

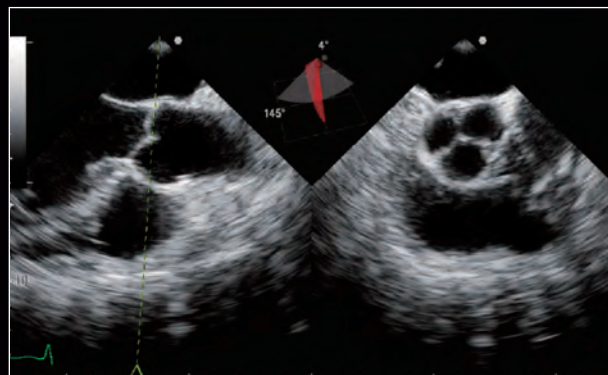


3D Zoom is a 3D display mode that visualizes structures in the region of interest in real time and with high resolution. Combined with the D'Art function, only two steps are required to obtain a 3D image of the object observed from a selected view angle. For example, displaying the image from the surgeon's point of view (Surgeon's View) can be useful in determining the course of treatment.



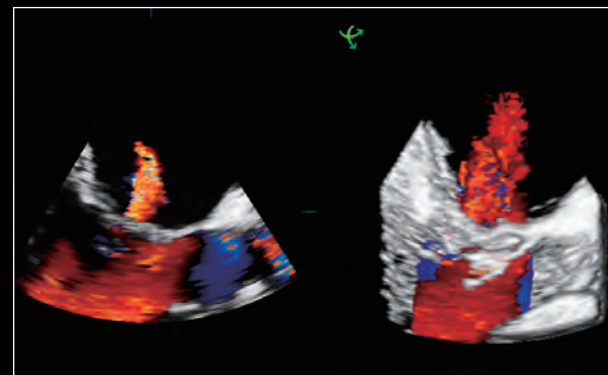
Observation of the mitral valve (D'Art function)

The Biplane mode, visualizing two orthogonal cross-sections in real time, can be used to observe mitral valve morphology or for monitoring cardiac function during surgery.



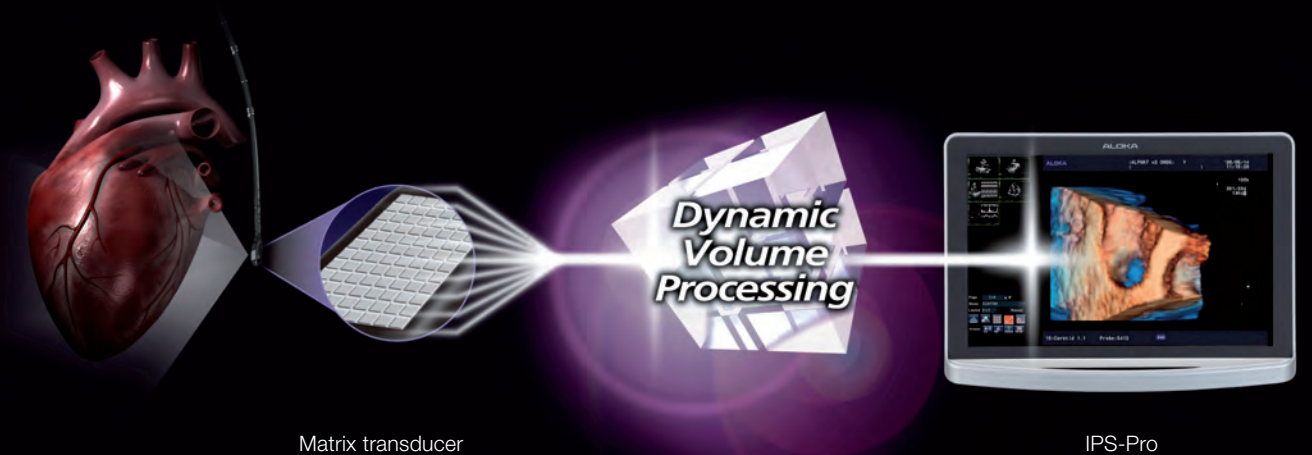
Biplane mode

Cross-sections required for diagnosis can be easily extracted from the 3D volume data and used for measurement.



3D Zoom mode (Flow)

“Dynamic Volume Processing” ensures the performance required for cardiovascular 3D imaging while maintaining the compactness and usability of the system. Designed as part of a platform dedicated to cardiovascular evaluation, it can store vast amounts of data acquired by the matrix probe and processes it at high speed. This technology allows the 3D transesophageal examination to be effortlessly incorporated into routine practice. Furthermore, the “Performance Mode” enables operation under appropriate settings for the region of interest without the need for cumbersome adjustment. The result is streamlined workflow maintaining patient and examiner comfort.





# Cardiac Function Clearly Defined

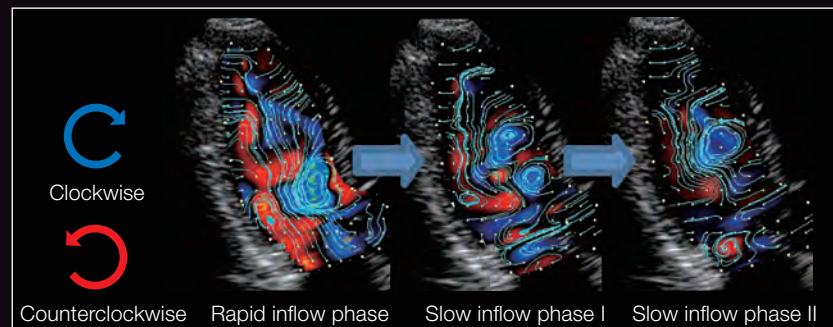
## Examination of cardiac function

Two-dimensional Tissue Tracking (2DTT) evaluates detailed cardiac muscle movement, while Vector Flow Mapping (VFM) provides further information on the hemodynamics of the heart. The combination of these two functionalities improves the validity and reliability of the evaluation of heart disease.

Furthermore, Clear Transmission Technology (Clear TT) combined with the use of Single Crystal probes achieves less patient-dependent variability providing maximum potential for advanced analysis.

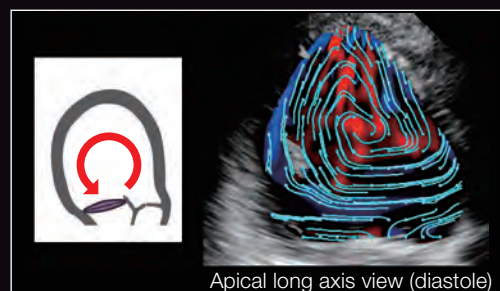
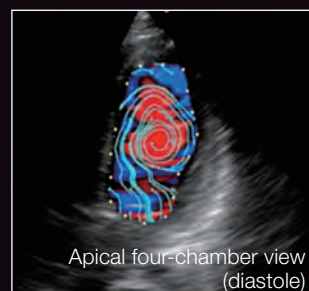
### Blood flow effectively acquired

Vector Flow Mapping (VFM) is a technology that visualizes the velocity vectors of blood flow in the heart. It allows evaluation of vortex properties, wall shear stress, energy loss, and other flow parameters in the heart.



### Apical long axis view

During diastole in the normal heart, the vortex generated at the anterior mitral leaflet propagates towards the apex.



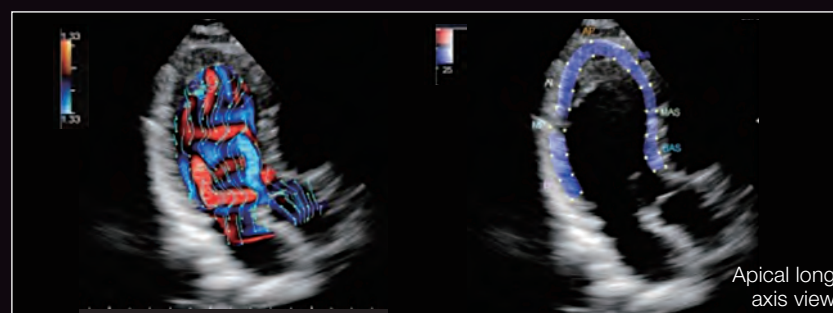
### Dilated cardiomyopathy

A vortex generated during diastole occupies the entire chamber.

### After valve replacement in an anti-anatomical position

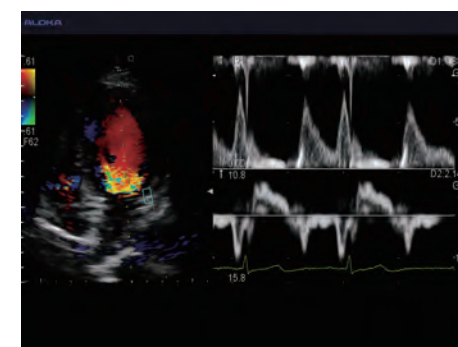
After surgery, the vortex circles abnormally in the opposite direction.

Combined with 2DTT, VFM allows evaluation of cardiac function in terms of both wall motion and hemodynamics.

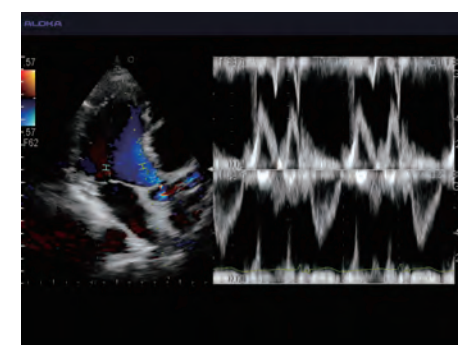


### Dilatation analyzed at depth

Dual Gate Doppler is a technology that simultaneously displays Doppler waveforms from two different points in real time. A combination of Tissue Doppler Imaging and Pulsed Wave Doppler (TDI/PW) allows simultaneous evaluation of wall motion and hemodynamics and enables measurement of  $E/e'$  (the ratio of the early diastolic transmitral velocity to early diastolic mitral annular velocity). It can also contribute to accurate diagnosis of arrhythmia and atrial fibrillation.



PW/TDI



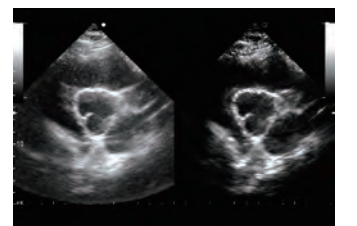
PW/PW

### Detailed visualization of the heart

By adopting technologies especially selected for cardiac examinations, the ProSound F75 Premier CV reduces patient-dependent variability. Increased examination quality and diagnostic confidence can be gained from the resultant image clarity.

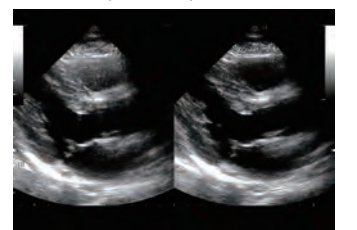
### Acoustic Noise Reduction (ANR)

Because biological tissues are heterogeneous, artefact is generated by the disturbance of the ultrasound beam during image formation. ANR reduces the artefact component by analyzing image formation disorder and enhances the borders of tissue structures.



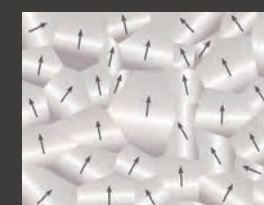
### Near field Noise Reduction (NNR)

NNR is an image filter developed to reduce artefact such as mirroring from the muscular layers and pleura and near field reverberations.



### Single Crystal Probe

This probe uses a single crystal piezoelectric device. Single crystals are efficient piezoelectric materials, which enhance sensitivity and improve penetration.



Piezoelectric ceramic



Single crystal



# Vessels Clearly Defined

## Examination of blood vessels

The number of patients with atherosclerotic disease is increasing rapidly around the world. Equipped with particular functions such as eTRACKING and Flow Mediated Dilatation (FMD), the ProSound F75 Premier CV monitors vascular changes invisible to the eye and contributes to early detection of atherosclerosis.



### For evaluation of systemic blood vessels – eFLOW+

eFLOW+ is a blood flow mapping mode that detects flow with high sensitivity and spatial resolution. Vessels not clearly defined in B-mode become well visualized by the use of eFLOW+. By using a variety of different probes, vessels in the entire body can be easily mapped.

## Capturing changes invisible to the eye

### FMD

The use of this technique for the evaluation of vascular endothelial function has been reported not only in atherosclerosis but also for determining the prognosis of other types of cardiac events, and the clinical value of this technique is growing.

The ProSound F75 Premier CV acquires data automatically and continuously throughout the examination facilitating easy data analysis.

## Evaluating atherosclerosis quantitatively

### Arterial Stiffness

The  $\beta$  value and pulse wave velocity (PWV) are numerical parameters evaluating the progress of atherosclerosis. With eTRACKING these parameters can be calculated easily and non-invasively.

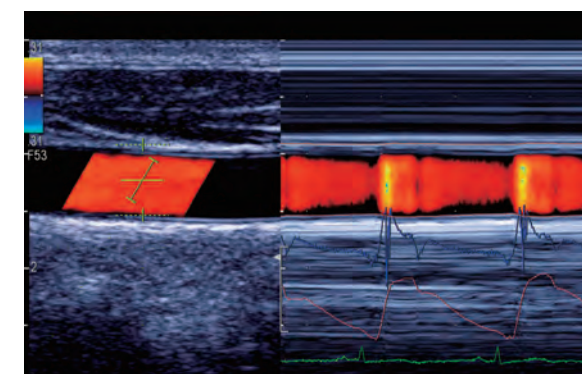
## Accurate evaluation of blood flow velocity in narrowed vessels

### CW Doppler using a linear transducer

Continuous wave (CW) Doppler can be acquired with a linear probe. High velocity blood flow through a narrowed vessel can be evaluated accurately using high frequency imaging transducers.

## Simultaneous evaluation of the heart and blood vessels

Blood pumped out of the heart circulates throughout the body through blood vessels. So inextricably linked are the heart and blood vessels that their forward and reflected waves interfere with each other. Wave Intensity (WI) is calculated from the changes in blood pressure and blood flow velocity at any chosen location in the blood vessel. It has shown promising results as a hemodynamic index for analyzing the effects of mutual interference in the cardiovascular system, such as systolic and diastolic properties of the heart and the effect of reflected waves from peripheral vessels.





# For more comfort and efficiency

The ProSound F75 Premier CV provides comfort during the examination for both the patient and the examiner. Using the concept of Natural Ergonomics, the flexible positioning of the system can be adapted to a wide variety of examination scenarios resulting in reduced physical impact on the examiner. Functions that require fewer steps of operation can streamline workflow enabling examinations to become shorter and more efficient.



Workflow



## Facilitate Workflow

### QuickSetter

Multiple Imaging parameters can be recalled with a single keystroke without interrupting the examination flow. Preferred conditions can be registered on the spot for different characteristics such as:

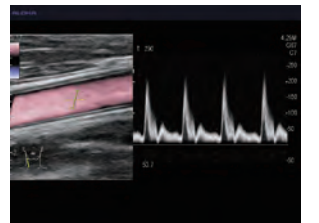
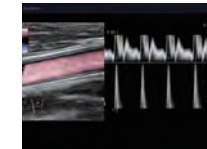
- Physique and target area of the patient.
- Examination purpose e.g. morphological observation and qualitative diagnosis.



### Image Optimizer

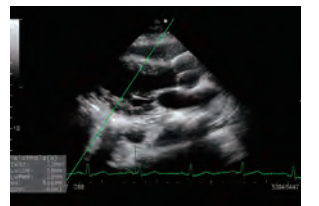
Images can be quickly optimized with a single action.

- In B-mode: Brightness is continuously monitored and optimized to the user's preference.
- In Doppler mode: Instant optimization of the velocity range, a parameter which normally requires frequent adjustments. Automatic base line shift can also be activated.



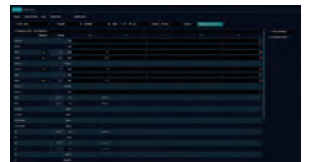
### Automated Cardiac Measurement

In a simple one button operation, important analyses of cardiac function such as Simpson and EF (Teichholz) measurements are performed using the latest software algorithms based on a large patient data base. The workflow is improved significantly.



### Advanced Cardiac Report

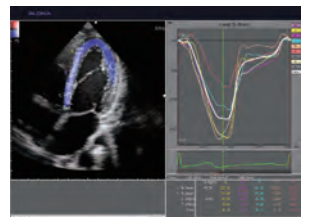
Advanced Cardiac Report follows the measurement guideline from the ASE. With seamless integration into the report (DICOM PDF), it can significantly improve workflow.



### DAS-RS1

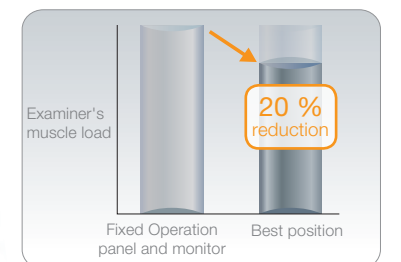
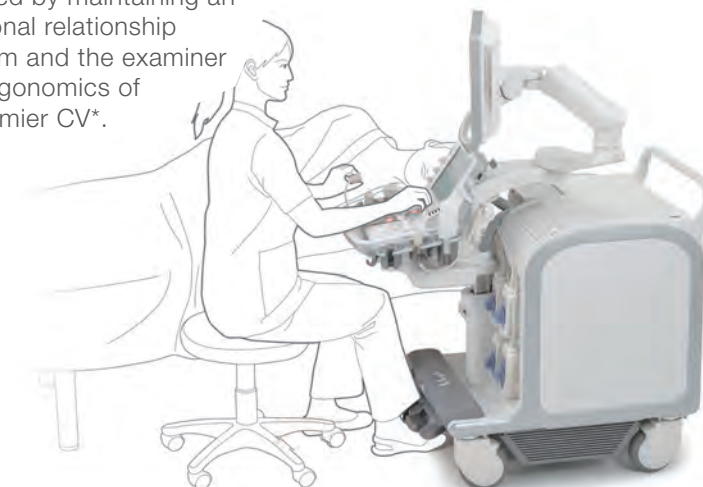
By storing raw data, off-line analyses can be performed at a later time. This enables the patient to leave the examination room more quickly contributing to more efficient examination workflow.

- VFM
- Echo Tracking
- 2DTT Analysis
- TDI
- Stress Echo



## Designed to ease the physical impact on the body – Numerical Evidence Confirms Natural Ergonomics

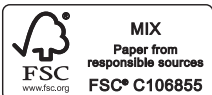
A natural and relaxed posture during examination reduces fatigue and the risk of musculoskeletal disorders in the examiner. With its flexibility in positioning, the ProSound F75 can adapt to a variety of examination scenarios. Hitachi, in cooperation with the Graduate School of engineering of Chiba University, has studied examiners' muscle load during operation, and their findings were incorporated into the design of the system bringing more comfort to those using it in daily practice. As has been demonstrated numerically, the examiner's muscle load can be reduced by maintaining an appropriate positional relationship between the system and the examiner through Natural Ergonomics of ProSound F75 Premier CV\*.



\*1: "Effects of a vertical console position on operator muscular stress during ultrasonic diagnosis" Journal of Medical Ultrasonics, 2012

\*2: "Effects of a horizontal console position on operator muscular stress during abdominal diagnosis" Journal of Medical Ultrasonics, 2013

# prosound F75 PREMIER CV



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 **Hitachi, Ltd.**

2-16-1, Higashi-Ueno, Taito-ku, Tokyo, 110-0015, Japan

Distributor for Europe

 **Hitachi Medical Systems Europe Holding AG**

Sumpfstrasse 13, 6300 Zug, Switzerland  
[www.hitachi-medical-systems.com](http://www.hitachi-medical-systems.com)