



Shelley Medical Imaging Technologies offers Blood Mimicking Fluids suitable for evaluating the performance of diagnostic medical imaging scanners. Our blood mimicking fluids provide the complex properties of blood without the problems associated with handling real blood.

Doppler Ultrasound Fluid Model: BMF-US

Model: BMF-US is a validated, stable, non-hazardous fluid that mimics the acoustic and physical properties of human blood for the evaluation of Doppler ultrasound techniques. The fluid is strained through a micro-filter to remove any clumps and fully degassed prior to packaging to eliminate artifacts from air bubbles. The scatterers are neutrally buoyant thus preventing clumping and settling scattering particles.

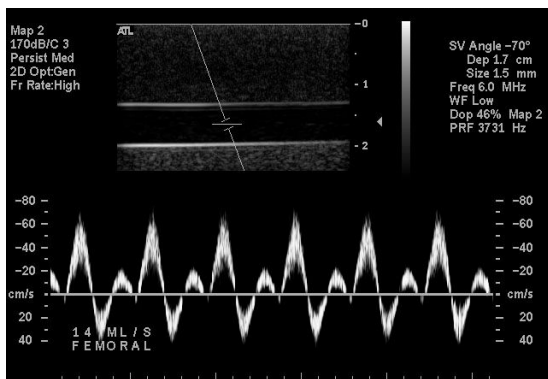
The BMF-US is formulated to meet the requirements for recommended blood-mimicking fluids as described in the IEC 1685 draft specifications.

Ultrasound Properties

Speed of sound:	$1548 \pm 5 \text{ ms}^{-1}$
Density of fluid:	$1037 \pm 2 \text{ kg m}^{-3}$
Scattering particle diameter:	$5 \mu\text{m}$
Scattering particle density:	1.03 g cm^{-3}
Particle concentration:	1.82%
Acoustic attenuation:	$0.05 \pm 0.01 \text{ (dB cm}^{-1} \text{ MHz)}$
Viscosity:	$4.1 \pm 0.1 \text{ (mPa s)}$

Blood Mimicking Fluid (BMF-US) Reference

Kumar V. Ramnarine, Dariush K. Nassiri, Peter R. Hoskins and Jaap Lubbers "Validation Of A New Blood-Mimicking Fluid For Use In Doppler Flow Test Objects" *Ultrasound in Med. & Biol.* Vol. 24, No. 3, pp. 451-459, 1998



Sample femoral waveform using Shelley's BMF-US, AccuFlow-Q physiological flow pump and U-245 Doppler Tissue Flow Phantom.



Magnetic Resonance Imaging Fluid Model: BMF-MR

Shelley offers a blood mimicking fluid that is suitable for the evaluation of magnetic resonance imaging techniques.

Ideal for angiographic techniques and quantitative flow measurements.

MRI Properties

T1:	850 ms @ 1.5 Tesla
T2:	170 ms @ 1.5 Tesla
Density:	1.02 g cm^{-3}
Viscosity:	4.1 mPa s

Blood Mimicking Fluids for both Doppler ultrasound and magnetic resonance imaging applications are available in 3 litre containers.

Optional Physiological Flow Pumps

Shelley Medical offers the following physiological flow pump products that can be used with BMF-US and BMF-MR;

- AccuFlow-Q Physiological Flow Pump
- CompuFlow 1000 Physiological Flow Pump
- CompuFlow 1000 MR Physiological Flow Pump
- CardioFlow 5000 MR Physiological Flow Pump

Shelley Medical offers a number of Doppler Tissue Flow Phantoms, custom designed flow phantoms and anatomically correct human vascular replica models for medical imaging and endovascular applications.