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1. Description

Components 850 µL PolySon™ L, ultrasound contrast agent (polymeric microbubbles)
or
5 x 850 µL PolySon™ L, ultrasound contrast agent (polymeric microbubbles).

Capacity 5 x 100 µL injections
or
25 x 100 µL injections.

Product format PolySon L is supplied as a sterile isotonic solution containing $\sim 3.2 \times 10^8$ microbubbles per mL.

Appearance Opaque, white liquid after resuspension by gentle mixing. Upon standing for several hours the liquid separates into a clear, colorless phase with an upper layer of air-filled microbubbles.

Storage Store at 2–8 °C. Do not freeze. The expiration date is indicated on the vial label.

For laboratory and animal research use only. Warning: Not for human or animal therapeutic or diagnostic use. Make sure to comply with all laws and regulations governing research on animals.

1.1 Background information

PolySon L consists of micrometer-sized air-filled polymeric particles of low mechanical stability specifically formulated for pre-clinical ultrasound imaging.

Due to large differences in their density and compressibility compared to tissue or plasma, dispersed PolySon L microbubbles are highly echogenic.

Upon intravenous injection, the intact microbubbles circulate in the blood pool for up to 10 minutes and are taken up by the reticuloendothelial system (RES), particularly in the liver and spleen.

1.2 Applications

PolySon L can be applied in various ultrasound imaging techniques, such as harmonic, subharmonic and B-mode imaging. Moreover, it is particularly suited for stimulated acoustic emission (SAE) imaging (bubble rupture) using a relatively low-energy ultrasound beam (low mechanical index). PolySon L is indicated for use in ultrasound imaging of small animals, for example mice, to facilitate evaluation of perfusion patterns and visualization of the liver and spleen. Examples include sensitive particle acoustic quantification (SPAQ) studies and perfusion studies of the cardiovascular system and renal system.

1.3 Physico-chemical properties

Particle size (number-weighted): 1–3 µm.

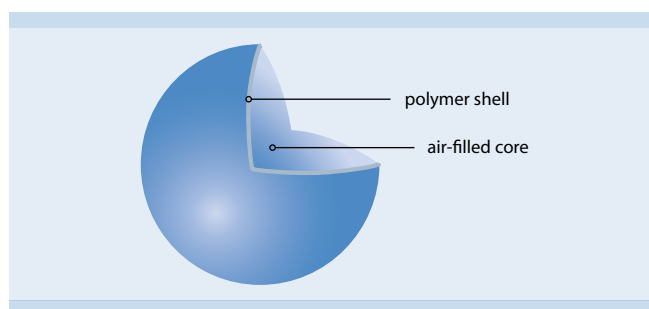


Figure 1: Schematic diagram of a polymeric microbubble.

1.4 Requirements

☞ Sterile syringes and needles (27–30 G)

Note: To allow sufficient volume for 5 x 100 µL injections per vial, the syringe/needle dead volume should be kept below 70 µL.

Tip: Use insulin or tuberculin syringes.

☞ 70 % ethanol

☞ Physiological saline (0.9 % NaCl) solution

2. Protocol

2.1 Preparation

☞ Read the entire protocol before starting.

☞ For a mouse weighing 20–30 g the typical injection volume is 100 µL corresponding to a dose of $\sim 1.3 \times 10^9$ microbubbles/kg body weight (for a 25 g mouse).

Note: Standard animal-handling procedures and local regulations must be followed.

2.2 Injection

- 🔗 Disinfect the septum with 70% ethanol. Let septum dry.
- 🔗 Warm the mouse tail to dilate the veins and enhance their visibility.
- 🔗 Gently agitate the vial by hand until a homogenous suspension is obtained. Do not vortex!
- 🔗 Inject PolySon L (typically 100 µL, slowly, within at least 20–30 seconds) via the lateral tail vein of the mouse. Immediately flush with physiological saline solution.

Note: PolySon L contains no preservatives. Avoid microbial contamination and discard any unused material after 24 hours.

2.3 Imaging

- 🔗 For SAE imaging use a low mechanical index (MI > 0.4).
- 🔗 Prior to liver or spleen imaging, a waiting period of 15 minutes, preferably 30 minutes, is recommended to allow for sufficient uptake by the RES.
- 🔗 For perfusion studies begin imaging immediately after injection.

Find examples of PolySon L-enhanced ultrasound images at www.viscover.berlin.

3. References

1. Teupe, C. *et al.* (2001) Assessment of myocardial perfusion by myocardial contrast echocardiography using harmonic power and the transvenous contrast agent SHU 563A in acute coronary occlusion and after reperfusion. *Int. J. Cardiol.* 77: 231–237.
2. Hauff, P. *et al.* (2004) Molecular targeting of lymph nodes with L-Selectin ligand-specific US contrast agent: a feasibility study in mice and dogs. *Radiology* 231: 667–673.

4. Related products

PolySon™ H # 130-095-152, # 130-095-153
PolySon™ T # 130-095-148, # 130-095-149

A comprehensive product portfolio for the imaging modalities MRI, CT, US, OI, SPECT, and PET is available at www.viscover.berlin.

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