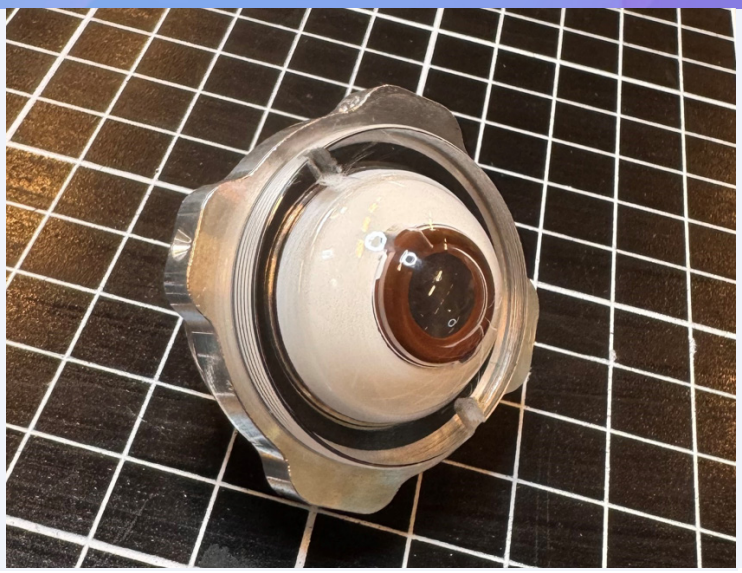
Model Eyes



TNO designs innovative retinal imaging devices in collaboration with partners. Before retinal imaging prototypes are validated on human subjects, it is essential to accurately test the prototype and to validate the optical model behind the innovative design.

For this validation, TNO has designed a series of Model Eyes which represent the tissue optical properties of the retina.

Optical tissue phantom types

TNO has developed 2 different types of optical tissue phantoms:

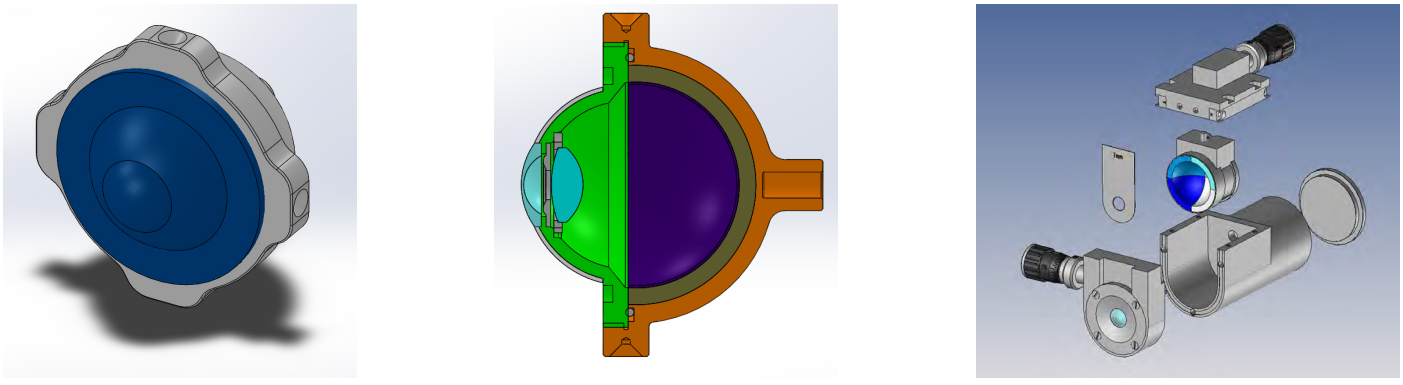
- **3D heterogenous tissue optical phantoms**
  3D heterogenous phantoms mimic different tissue layers along with their scattering and absorption properties. They may be realized in a 3-dimensional shape.
- **3D dynamic phantoms**
  In 3D dynamic phantoms at least one of the optical tissue mimicking properties can be dynamically controlled, such as the oximetry of blood in a retinal vessel.

The Model Eyes are typically water-filled to simulate the optical properties of the vitreous chamber.

Tailor made Model Eyes

TNO is specialised in the development of Model Eyes. These Model Eyes can be customized with e.g. the following options:

- Adjustment of diopter through distance of lens to retina
- Interchangeable pupil sizes
- Adjusting the tissue optical properties of the retinal layers:
  - absorption properties
  - scattering properties
  - fluorescence properties
- Structural information can be added by addition of:
  - Fluorescent microspheres
  - Vascular structures



V1 model eye created for VIVA project with connectors and optics for final phantom eye (left, middle). Fully customizable model eye built by TNO (right)

TNO innovation for life

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