

# LICENSING OPPORTUNITY

ETH transfer – Linking Science and Business

## Safe dispensing of hazardous liquids

### Keywords

Injection unit, Liquids, Radioactive material, Biohazardous material, Silicon flat gasket, Decontamination,

### Summary

The major challenge in handling toxic (i.e. radioactive, biohazardous) liquids is to avoid contamination of the environment. Safety of dispensing and shipment is key. To offer highest safety possible, the presented setup for dispensing minimizes the volume which is exposed in a worst-case scenario and also allows for on-line decontamination should such an event occur.

### Background

Radioactive materials are commonly shipped in solution, i.e. as liquids. Dispensing of such liquids is a very cost-intensive process because it often needs large shielded boxes ("hot-cells"), specially secured areas and high investments in building-safety as specially ventilated areas, on-line contamination monitoring and

detailed requirements in case decontamination were necessary. Such large investments also cause significant costs in maintenance. With the increased use of radiopharmaceuticals, such dispensing is a common industrial process.

### Patent Status

- Patent pending

### Invention

The apparatus automates the process of filling hazardous liquids into containers where this was previously a manual task. The key mechanism of the invention consists of three cannula that pierce through a silicon seal with different depths of penetration. Two of the cannula are inserted into the container that is to be filled, while the third cannula can be used to create a vacuum outside the container or introduce disinfecting agents (Fig. 1). The closed system state is granted at all times by means of a simple spring mechanics element, creating stable conditions and robustness of the system against operating errors (Fig. 2).

### Features & Benefits

- Less radiation exposure for the user
- Faster delivery of isotopes
- Small and portable system
- Low production and maintenance cost
- Easily adaptable to any specific production site

### Field of Application

- Radio isotope delivery
- Hazardous liquids
- Biohazardous liquids

### References

Nobst, Nauser, Alf, Schubiger, Schibli, Ametamey, Poster at ISRS the 19th International Symposium on Radiopharmaceutical Sciences, 2011 Amsterdam

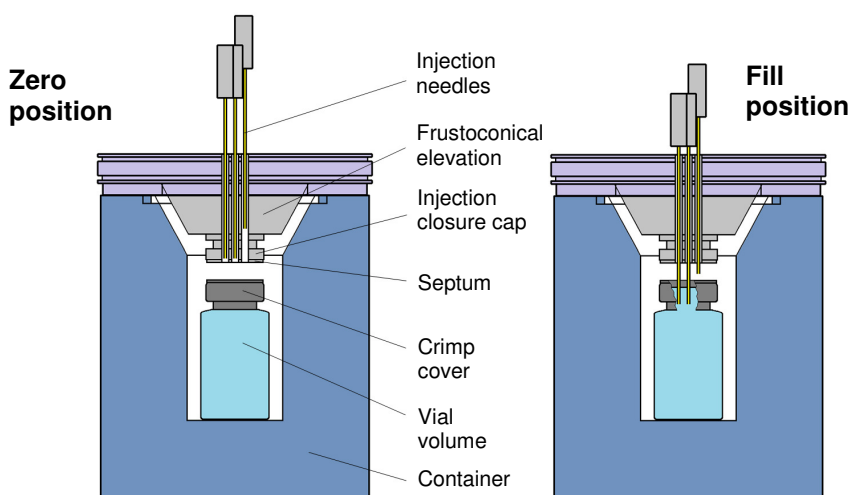


Fig. 1: Different modes of the key mechanism

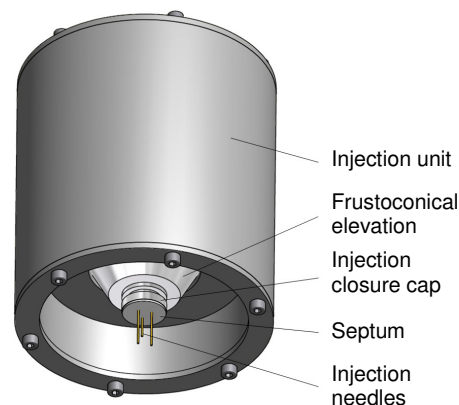


Fig. 2: System from below

Ref. No. T-11-065

ETH Zurich  
ETH transfer  
Zurich, Switzerland

+41 44 632 23 82  
transfer@sl.ethz.ch  
www.transfer.ethz.ch

**ETH**

Eidgenössische Technische Hochschule Zürich  
Swiss Federal Institute of Technology Zurich