

# Tech Note

## Quality Aspects for Ampules

### Abstracts

This tech note informs about tolerances and shapes of Zeochem primary packaging material. For simplifying solvent handling in  $^1\text{H-NMR}$  spectroscopy Zeochem AG offers its portfolio of solvents in small and easy to handle amber ampules.

The glass ampules are filled and subsequently sealed hermetically. A 100% leak test is applied to the sealed ampules.

Additionally, some recommendations are listed to avoid any contamination when using pipettes and sample tubes.

### Ampule shapes: The sealing process

Empty ampules are filled with a precision piston stroke pump. The product loaded ampules are overlaid with nitrogen to prevent any kind of moisture uptake and exchange with hydrogen from ambient air.

Before sealing, the content is cooled down keeping the nitrogen overlay until the ampule neck is fused to a dome shaped end. The ampule is now completely gastight.

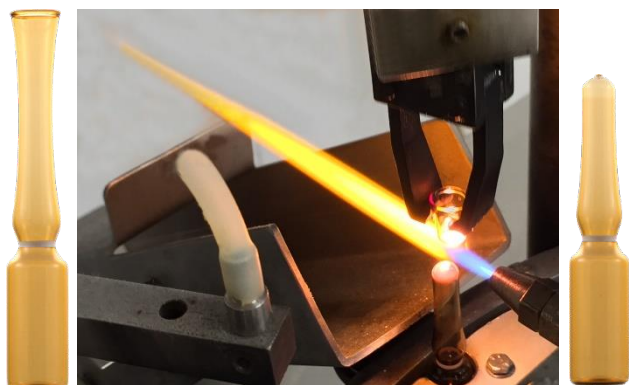


Fig. 1 Ampule shape before and after sealing



### Sealed ampule dome shapes

Due to the different nature of products, the shape of the formed dome at the sealing zone may slightly vary. All shapes illustrated below are approved by Zeochem's Quality Unit and not subject to quality complaints.



Fig. 2 sealed and tight ampule dome shapes

### Discoloration at the top of sealing

For sealing the ampule neck heat needs to be applied. The product will be protected by nitrogen overlaying during this process. In some cases discoloration at the top of the sealing may evolve due to the nature of the product. E.g. iodomethane- $\text{d}_3$  causes a slight purple coloration, the product itself has a pale purple coloration also. This is not a reason for a quality complaint as it is an unavoidable attribute of certain products in the sealing process.

### No carbon residues at the sealed ampules neck

Zeochem AG assures high quality product ampules that don't have any carbon residues inside the sealed ampule neck even in the presence of discolored sealing top.

### 100% leak test for Ampules

### No compromises to safety and quality

After sealing all ampules undergo a leak test where they are stored at low pressure (200mbar) for 2 hours at ambient temperature ( $25^\circ\text{C}$ ). Only tight ampules are finally packed into the protective boxes.

### Visual and quality inspection

The final quality inspection against the individual product specification is performed with the product

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