

## New atomizer producing sprays with narrow drop size spectra

### Keywords

Uniform atomization  
Simple construction  
No clogging  
Spray drying  
Nozzle/orifice

### Inventors

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**Stage of Development**  
Prototype

**Status of Patent**  
AT-patent filed

### Kind of Co-operation

- Licensing
- Technical co-operation

### Advantages

- ✓ Atomizer producing drop streams without the need for bore holes
- ✓ Reliable; low clogging risk
- ✓ Narrow drop size spectra, mean drop size adjustable
- ✓ Simple design with robust components

### Potential Fields of Application

- ✓ Spray drying
- ✓ Moistening of food / decontamination
- ✓ Spray coating (e.g. materials, lithographic processes)
- ✓ Agricultural applications
- ✓ Food technology and pharmaceutical industry

### Overview

Controllable atomization of liquids with a clogging-free annular gap atomizer.

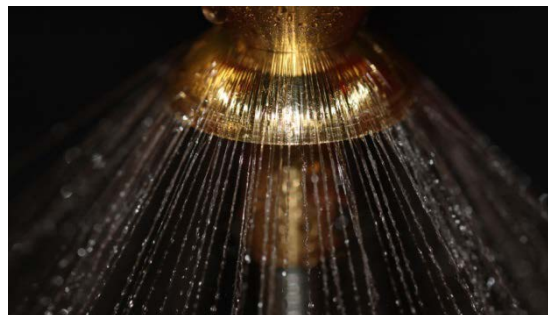
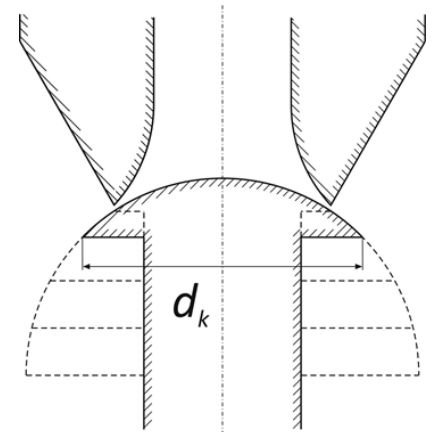
### Background

In many applications, atomized liquids are used. Atomizers commonly used in the chemical, pharmaceutical and food industries produce sprays with wide drop size spectra with the mean drop size depending on the liquid material properties. The present atomizer offers narrow, adjustable drop size spectra widely independent on the liquid material properties, producing drop streams without the need for bore holes.

### Technology-Overview

Using an annular gap nozzle with curved orifice walls, liquids are atomized with a narrow drop size spectrum by creating a Dean flow. The instability of the Dean flow running under pressure between two stationary curved solid walls forms vortices at the exit of the flow channel which turn into individual liquid jets.

At the annular orifice, therefore, individual liquid jets are formed rather than a closed liquid lamella. In contrast to many other atomizer designs, the drop size is widely independent on the liquid material properties and the liquid flow rate. Varying the gap width enables the mean drop size to be controlled. The annular shape of the orifice reduces the clogging risk. The drop size spectra formed may be termed monodisperse according to the VDI guideline 3491, since mean and modal drop sizes mutually differ by less than 10%.



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