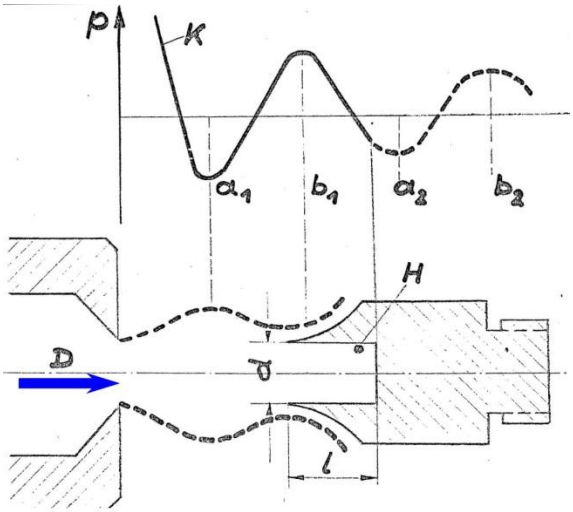
The Hartmann Ultrasonic Generator

Mode of Operation:

- Exiting a nozzle at supercritical pressure ratio, air leaves a nozzle at the speed of sound.

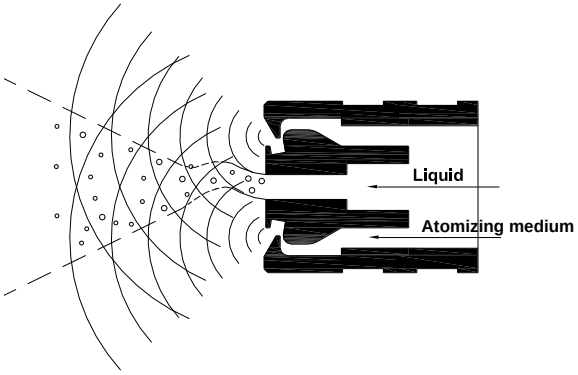
supercritical pressure: p / p_o = approx. 0.54,
i.e. air reaches speed of sound at a pressure of approximately 0.85 bar (g)



- The resulting jet periodically fluctuates in density.
- If an on one side closed opening is placed opposite the nozzle exit, this leads to the relaxation oscillation.
- The opening is filled up with air to a certain density, which ultimately leads to the sudden emptying of this opening (= relaxation oscillation).
- These relaxation oscillations take place in the ultrasonic range.
- The depth of the opening determines the frequency of ultrasound.

The DUMAG® Nozzle and the Hartmann Ultrasonic Generator

In the DUMAG®- Ultrasonic Nozzle the opening of the Hartmann Ultrasonic Generator is situated toroidally opposite the circular gas outlet.



- The DUMAG®- Ultrasonic nozzle has shown that the most effective atomization occurs at 18,000 to 23,000 Hz.
- The toroid Hartmann Ultrasonic Generator is dimensioned accordingly in our Ultrasonic nozzle.
- The high exit velocity of the gas used for atomization (compressed air, steam, combustible gas) causes high turbulences and crude pre-atomization of the liquid.

Additionally:

The ultrasound created by the Hartman Ultrasonic Generator puts the pre-atomized drops into high frequency oscillation and further breaks them up into very fine drops.

This is how we ...

- **further atomize lowly viscous liquids**
- **atomize the liquid jet as a whole, even if loaded with sediments**
- **atomize more than one liquid in the same nozzle at the same time**