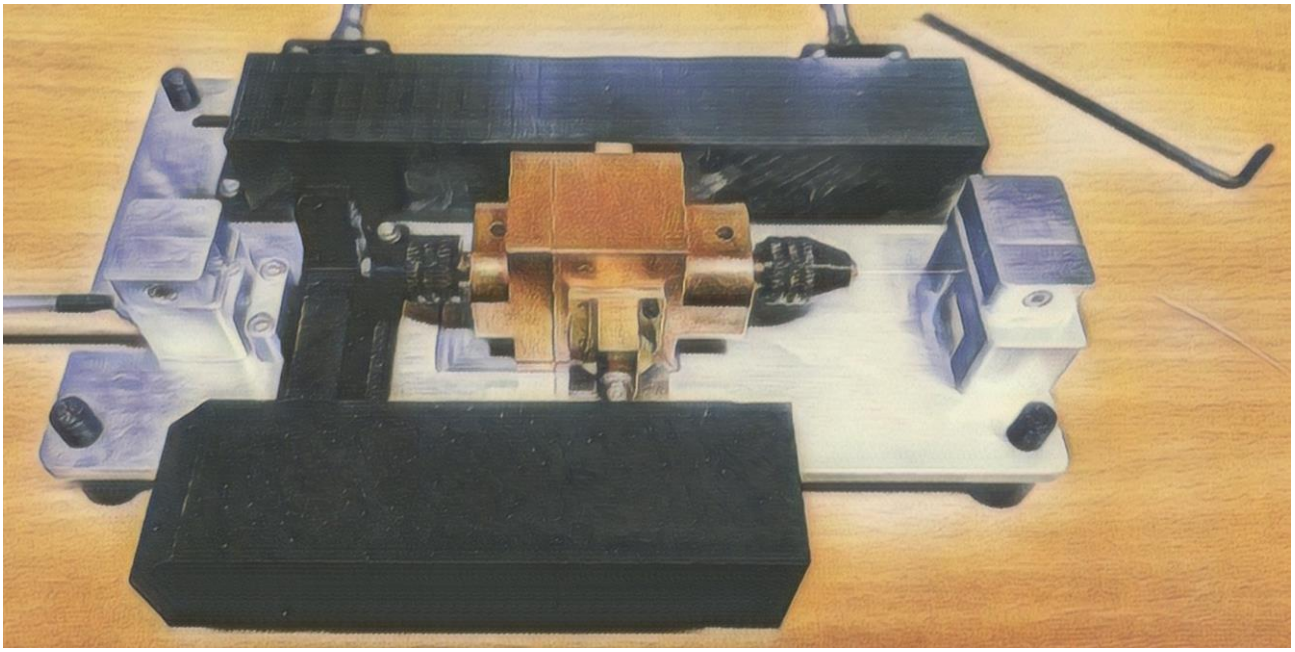
CAVITY RESONATOR FOR CONDUCTIVE WIRES (37-70 GHZ)

Cavity resonator (CR) is a cylindrical hollow cavity operating at eight TE_{0mn} modes with resonance frequencies spanning from 37 GHz up to 70 GHz, respectively. It allows measuring electric conductivity of a wire with the diameter as low as **100 microns**.

Frequency change due to insertion of the wire is translated into its **effective diameter**, whereas the corresponding Q-factor change is exploited to extract its **electric conductivity**. The use of micro-chucks allows keeping the wire tight and centered inside the cavity, thus, enabling **good repeatability** of the measurement.

A dedicated rigorous analytic **electromagnetic model** of the cavity ensures **accurate** extraction of the electric conductivity of the wire under test in a split second.



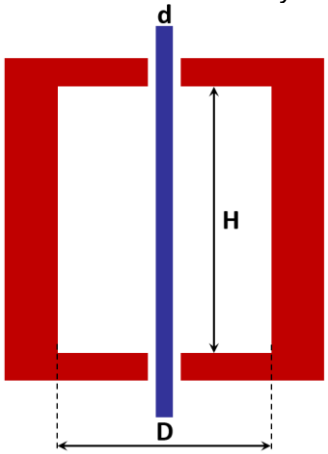
Cavity resonator

with wire-centering micro-chucks

Wire parameters:

- **diameter**: 100 - 450 microns
- **length**: >10 cm
- **conductivity**: $\sigma > 10^5$ S/m

Maximum achievable accuracy: $\delta\sigma < 1\%$



Cross-section of the cavity with the wire under test