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### Reproducibility and life duration assessment of cMUT transducers

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Cmut-based transducers are often expected to be superior in terms of reproducibility to piezoelectric transducers due to the use of microelectronic technology instead of more traditional machining techniques.

During the conventional (sacrificial-layer based) production process of cmut transducers, various process steps can display inhomogeneities and uncertainty in flow rate, temperature profile, stoichiometry, or other aspects, resulting in variations in layers thicknesses, gap height, and material properties, each having an impact on transducer performances.

In this study, we choose to use impedance measurement technique as evaluation tool for the stability of the properties of cmut transducers. A large number of cMUT transducers with the same design, were characterized, allowing to compare their properties from wafer to wafer, and according to their position of origin in the wafer.

The resistance of cmut transducers to temperature cycling was also investigated, using impedance and optical measurements control before and after a 3-days +60/-20°c test.

The reliability was tested under a long-duration electroacoustic measurement, where a cMUT transducer was submitted to periodic large amplitude excitation, and its pulse-echo response recorded for several hours.