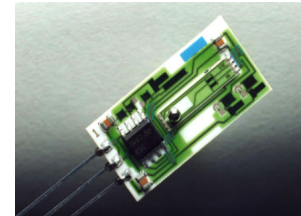


Solder / glue assembly of cantilever bar force or displacement sensors

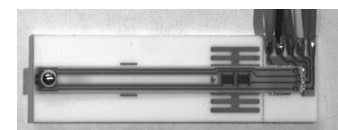
Thomas Maeder* and Dominique Genoud**

* Sensile Technologies, PSE-B, CH-1015 Lausanne, www.sensile.com

** Institut de Production Microtechnique, EPFL, CH-1015 Lausanne



MilliNewton 400 mN force sensor



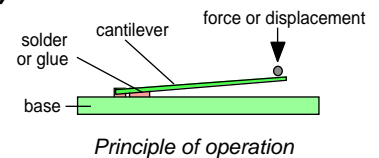
Prototype 0.5 mm displacement sensor

Features

- Piezoresistive thick film (hybrid) technology
- Force and displacement sensors
- Surface mount of cantilever onto base
- Solder (Sn-Pb, Sn-Ag) or conductive epoxy glue
- **Issue: creep of solder / conductive glue joint**

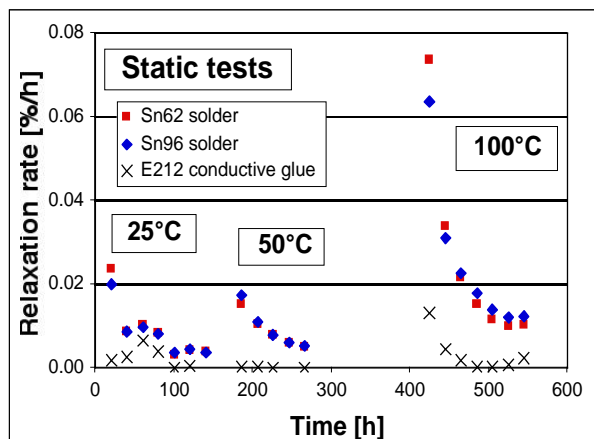
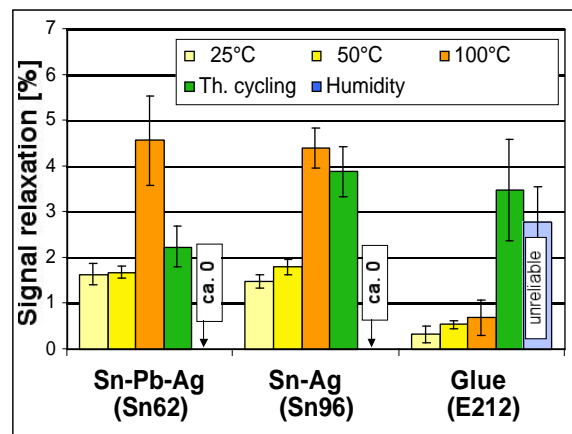
Testing (displacement sensor, 1 week each at 200% full scale)

- Temperature: 25°C, 50°C, 100°C
- Thermal cycling -25°C...+100°C
- Humidity : 85°C / 85% RH



Results

- Glue better than solder in static, “dry” tests
- Similar performance in thermal cycling
- Severe corrosion of conductive glue during humidity test
- Creep is **not** critical for force sensors
- Creep is **critical** for displacement sensors



- Creep falls off very rapidly with time
- Creep is concentrated at end of joint

