



nanomade

Make All Materials Smart

Single point CapaForce© sensor



CapaForce© technology

Capacitive + Strain sensor

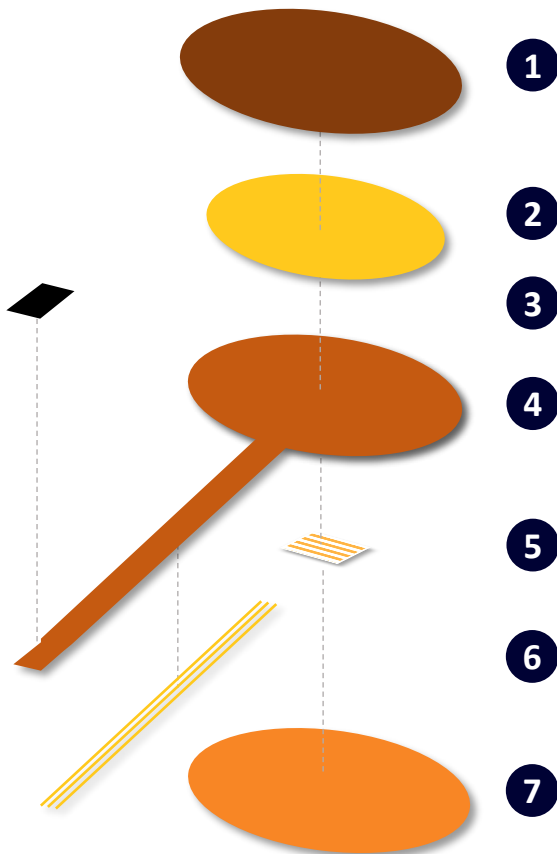


nanomade

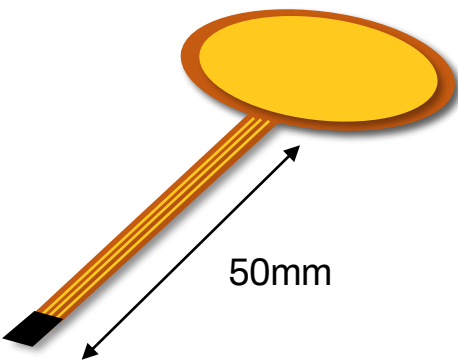
Make All Materials Smart

Single point CapaForce© sensor

Sensor stack-up



$\varnothing = 22\text{mm}$



50mm

Thickness= 0.2mm

Item	Part	Description
1	Coverlayer	Polyimide + Adh - 27.5 μm
2	Capacitive electrode	Copper - 12 μm
3	Stiffener	Polyimide + Adh - 265 μm
4	Substrate	Polyimide - 25 μm
5	Strain electrodes + ink	Copper - 12 μm
6	Conductive tracks	Copper - 12 μm
7	Encapsulation layer	Polyimide + Adh - 126 μm

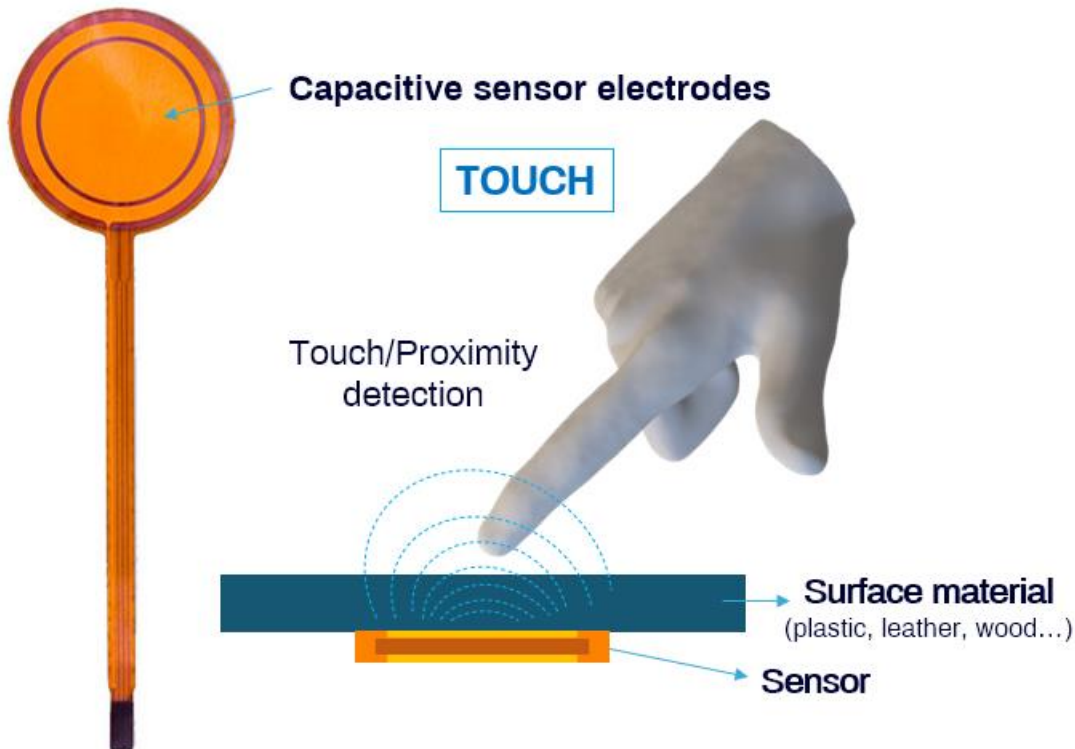


nanomade

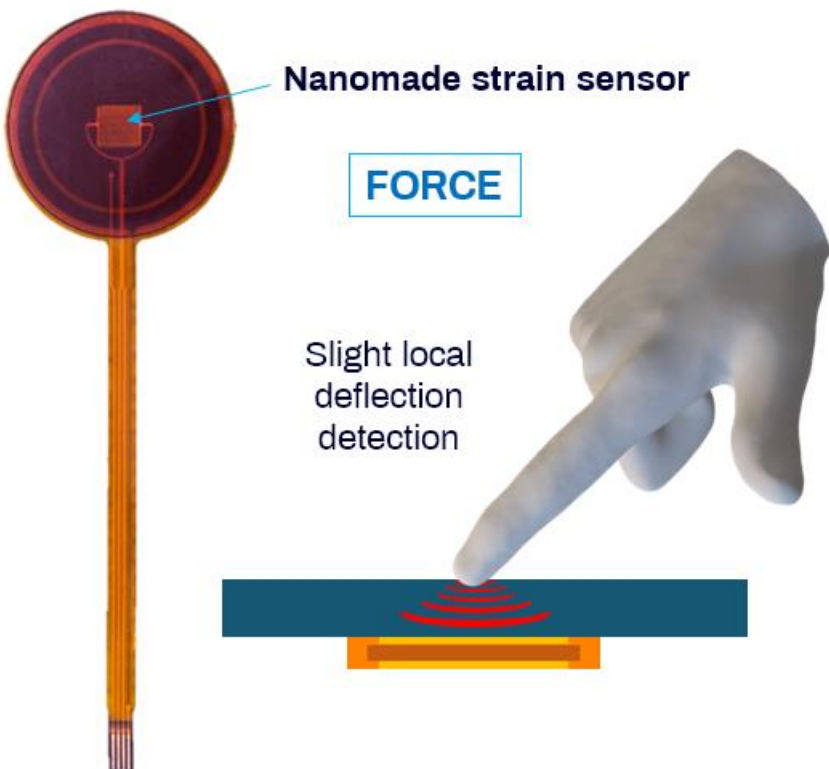
Make All Materials Smart

Single point CapaForce© sensor

TOP



BOTTOM



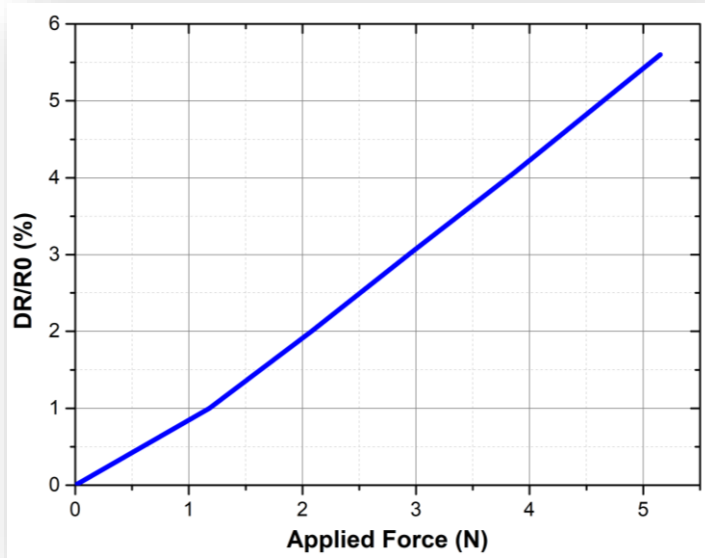


nanomade

Make All Materials Smart

Single point CapaForce© sensor

Typical Resistance variation/Force Response*



Typical Sensor Properties

Value

Note

Operating range	From g to kg	Depending on integration
Gauge factor	120	-
Operating voltage	From 3.3 to 5V	Typical values
Nominal sensor resistance	5k Ω	Typical value. Can be tuned during printing.
Lifetime durability	>10M cycles**	Average resistance change 3% @ 10M cycles

Environmental Stability

High Temperature Storage	< +3%	Change in resistance: 85°C for 96 hrs
	< -5%	Change in sensitivity: 85°C for 96 hrs**
Low Temperature Storage	< -10%	Change in resistance: -80°C for 96 hrs
	< -3%	Change in sensitivity: -80°C for 96 hrs**
High Humidity Storage	< +5%	Change in resistance: 85°C / 85% RH for 500 hrs
Temperature cycling	< 8%	Change in resistance after 10 cycles +80°C to -40°C

*3 points bending measurement - sensor glued under 1mm thick glass

** 500g applied on sensor glued under 1mm thick glass