16 Piezoelectric Cantilever Probe to Measure Coating Thickness in Drug Tablets

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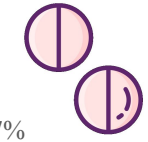
User Need & Objective

No way to accurately measure tablet coating thicknesses

Coating vital to product effectiveness, palatability, and cosmetics



Coating defects account for 0.27% or roughly 36 million tablets a year

Objective: Use PEF to measure tablet coatings with new probe

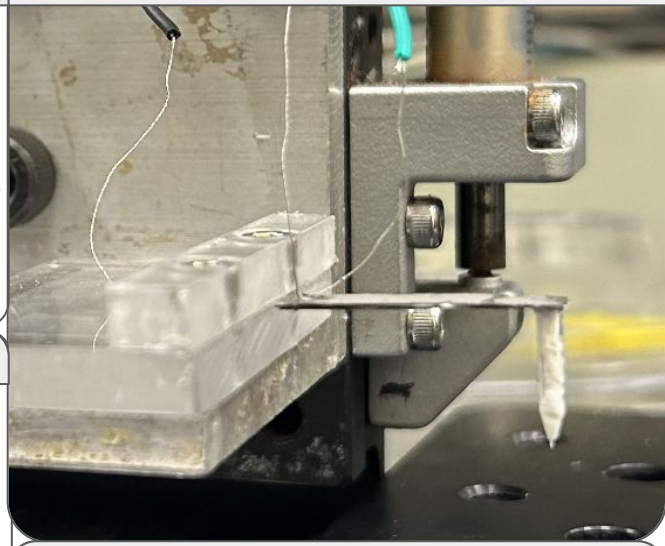
Solution: Design

Piezoelectric Finger (PEF):

- Finds coating depth through elastic modulus
- Must find thickness of 200-100µm

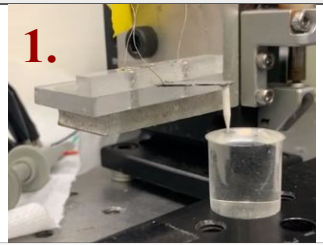
③ $E = \frac{3K}{4d} * \frac{(V_{in,0} - V_{in})}{V_{in}}$ & ④ $\frac{h}{E} = \frac{h_c}{E_c}$

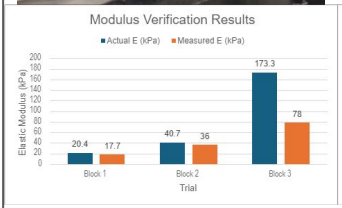
Solution: Build



Verification Testing

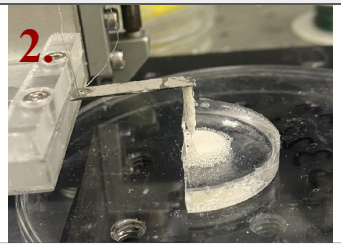
1.

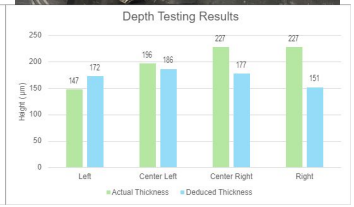




✗

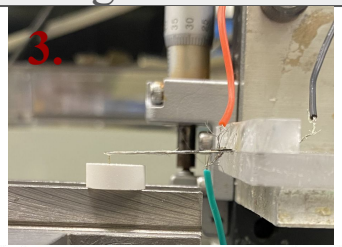
2.





✗

3.



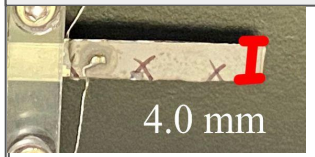
#	N.STD	Device Damage	Sample Damage	P/F
1	0.076	0	0	✓
2	0.014	0	0	✓
3	0.061	0	0	✓
4	0.043	0	0	✓

✓

Results:

Solution can accurately and precisely deduce coating thickness, but only on materials with stiffnesses ≤ 40 kPa

Conclusion & Future



Revisions:

- Create less labor intensive building process
- Change PEF geometry to increase device sensitivity

Impact:

- Tablets can accurately & reliably be assessed
- Strengthen the drug manufacturing process
- Reduce production costs & improve patient safety