# Piezoelectric Finger (PEF) as a Tablet Coating Thickness Assessor

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## Need

FDA requires online tablet coating thickness verification during manufacturing

### Objective

To measure tablet coating thickness using PEF with a thin probe

*Current options: slow or destructive*

## Prototype Device Testing

***PEF 3:*** *0.4mm probe diameter*

PEF measurements follow trend of test samples between 0.3 and 0.8 mm

| Caliper | PEF |
|---|---|
| 0.23 | 0.28 |
| 0.31 | 0.28 |
| 0.38 | 0.47 |
| 0.6 | 0.55 |
| 0.8 | 0.71 |

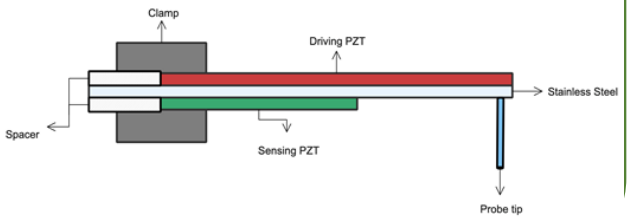
*Values in mm*

## Solution

**Piezoelectric finger (PEF):**
In-situ Elastic Modulus sensor
Quantify coating thickness through Elastic Modulus

$$E = \frac{1}{2}\left(\frac{\pi}{A}\right)^{1/2}(1-\upsilon^2)\frac{K(V_{in,0}-V_{in})}{V_{in}}$$ [2]

**Requirements:**
- PEF should measure thickness between 0.2 and 0.4 mm with 20% error allowance




## Conclusion

PEF prototype is accurate in modeling coating thickness between 0.3 and 0.8 mm

**Impact:**
Low cost, accurate, on-line tool for tablet coating quality control in pharmaceutical manufacturing