



United States

**Consumer Product Safety Commission**

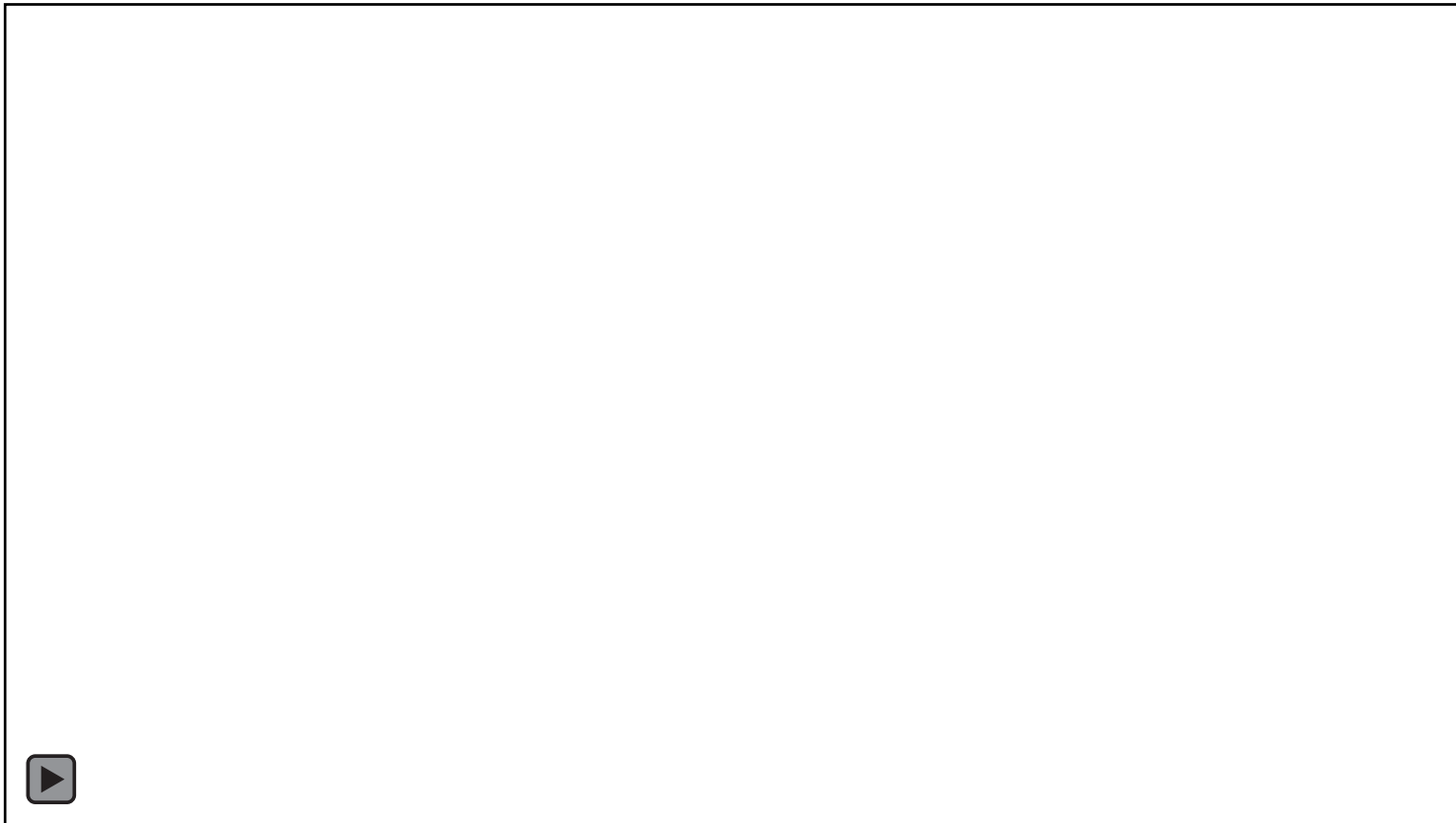
# **Preliminary Testing of Finger Probe for Treadmill Entrapment Requirements**

April 25, 2024

Fred DeGrano, Mechanical Engineer

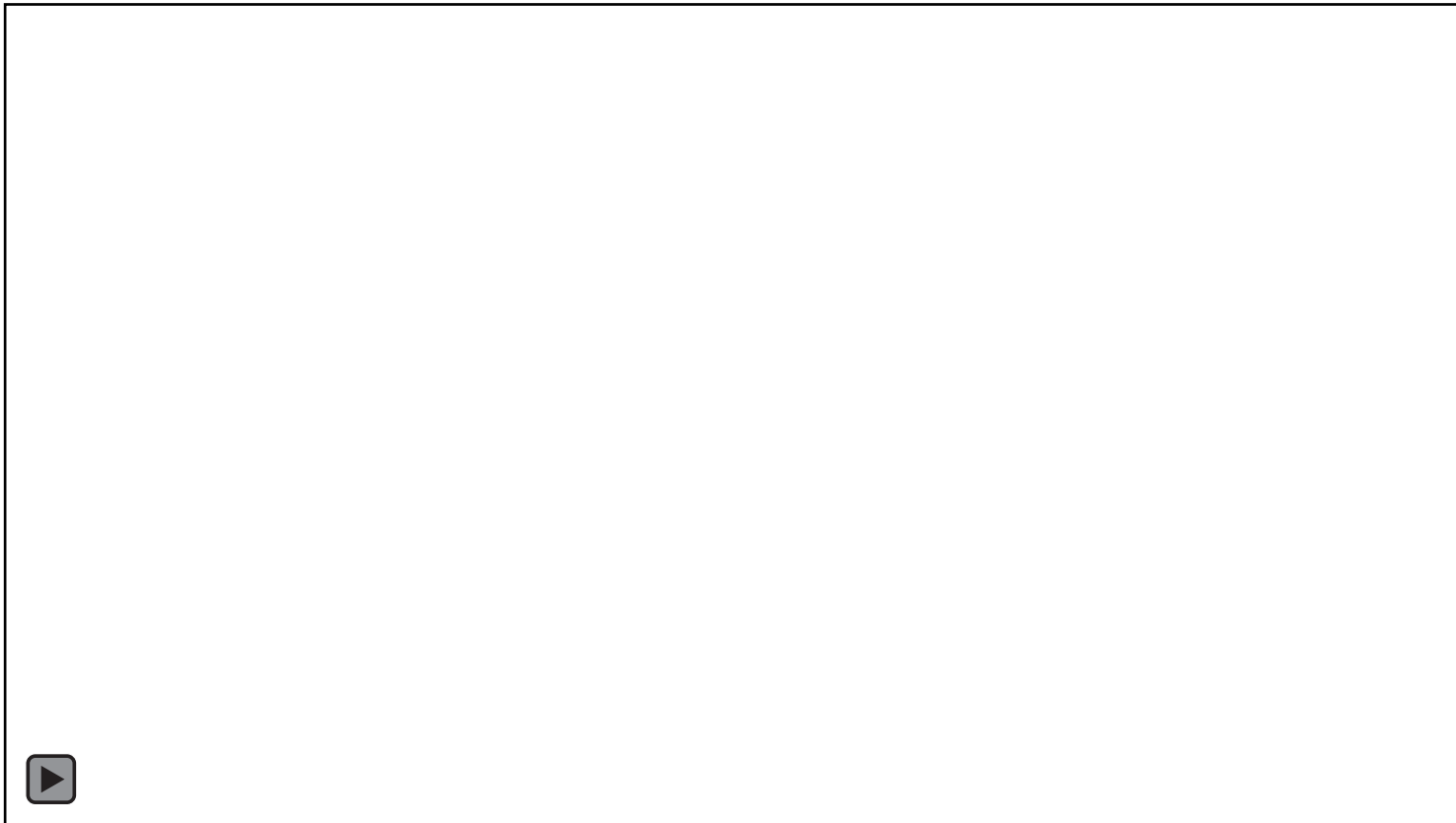
***Disclaimer:** This report was prepared by the CPSC staff. It has not been reviewed or approved by, and may not represent the views of, the Commission.*

# Finger Probe Test



- **Finger probes:**
  - Rigid probe: 3D printed
  - Compressible probe: silicone mold mix with wooden skewer 'skeleton'
  - Firmness and structure of compressible probe is qualitatively similar to human finger
  - Both probes identical dimensions as prescribed in ISO 20957-1:2013
- **Rear roller guard**
  - Constructed based on draft requirements distributed on 11/23/23
  - Gap from tread adjusted to prevent insertion of rigid finger probe
- **Result**
  - Rear roller guard prevents pull in of rigid probe but allows pull in of compressible probe with little to no force (see video)
- **Conclusion**
  - Compressible probe is a more realistic surrogate for human finger
  - Rigid surrogate finger probe is inadequate to prevent finger entrapment

# Feasibility of Compressible Finger Probe



- Gap between rear roller guard and tread reduced to prevent pull in of silicone probe
- Treadmill operation unimpeded by rear roller guard
- Compressible probe as a realistic analogue for human finger does not get pulled in
- Guard adequately reduces the risk of finger entrapment



Note: Nitrile glove covering silicone probe to prevent further damage to probe



CPSC.gov     USCPSC