



Spicing up Paint! Properties of Cayenne and Paprika as Pigment

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2.671 Measurement and Instrumentation



Abstract

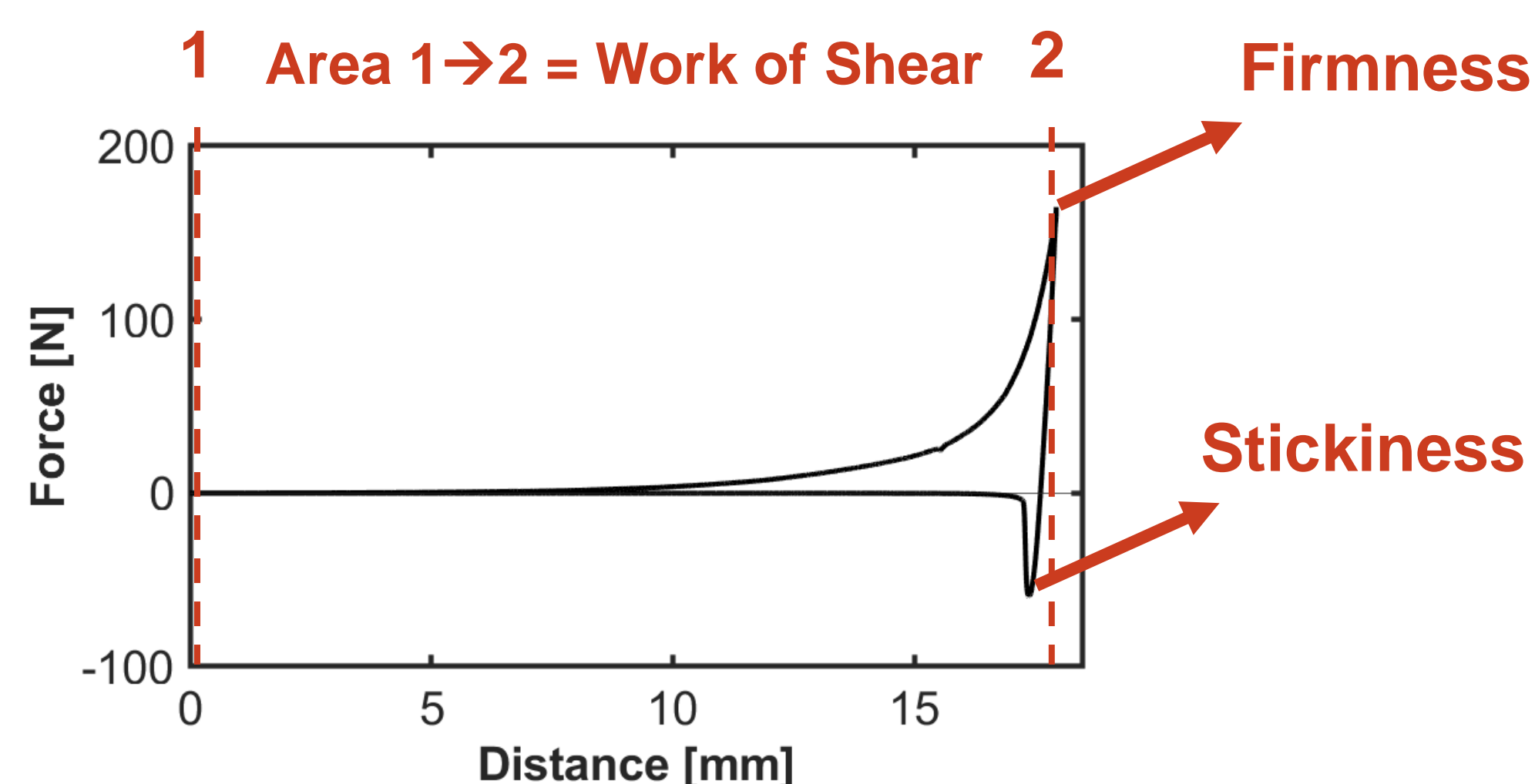
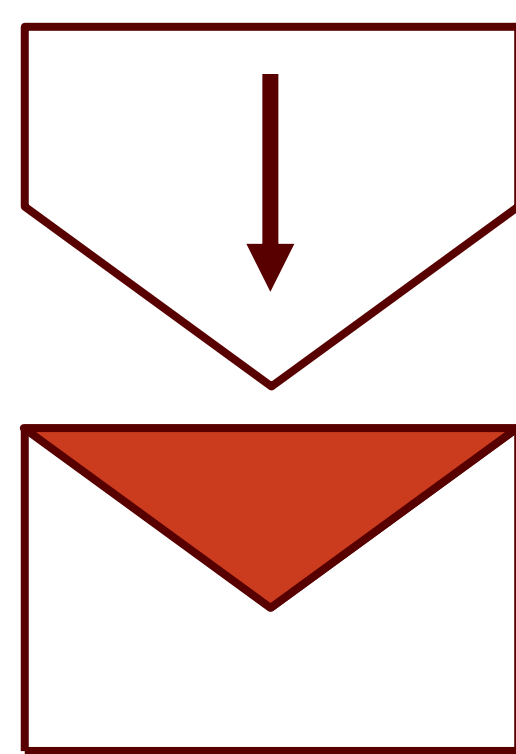
Determining if cayenne and paprika are suitable for creating red paint can benefit the environment, the creativity of artists, and the accessibility of painting. The work of shear and color of 5 paint samples each of 5 different mass fractions of pigment for both spices were evaluated. Work of shear of the paint under compression is measured using a conical rig on a Texture Analyzer, analogous to work exhibited by a brush. Red color is represented as a ratio of the “R”-factor of the average RGB value determined in MATLAB from swatches of each sample. Properties for spice-based paints are compared to Liquitex Cadmium Red Deep Hue to inform how these paints can be adopted into regular practices. Paprika is found to be more red and requires greater work of shear than cayenne. For both paints, 12% pigment concentration is most similar to Cadmium Red in terms of spreadability and 24% in terms of redness.

Background and Setup

ww%	Pigment (mg)	Water (mg)	Binder (mg)
6%	480	400	7120
12%	960	800	6240
18%	1440	1200	5360
24%	1920	1600	4480
30%	2400	2000	3600



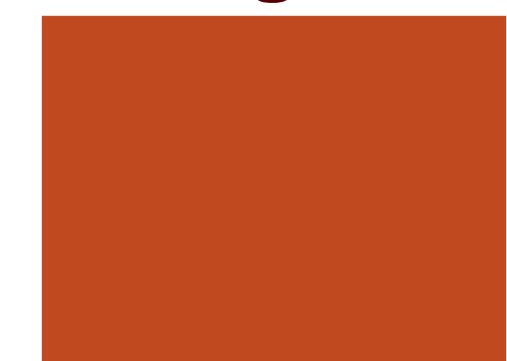
Spreadability Rig



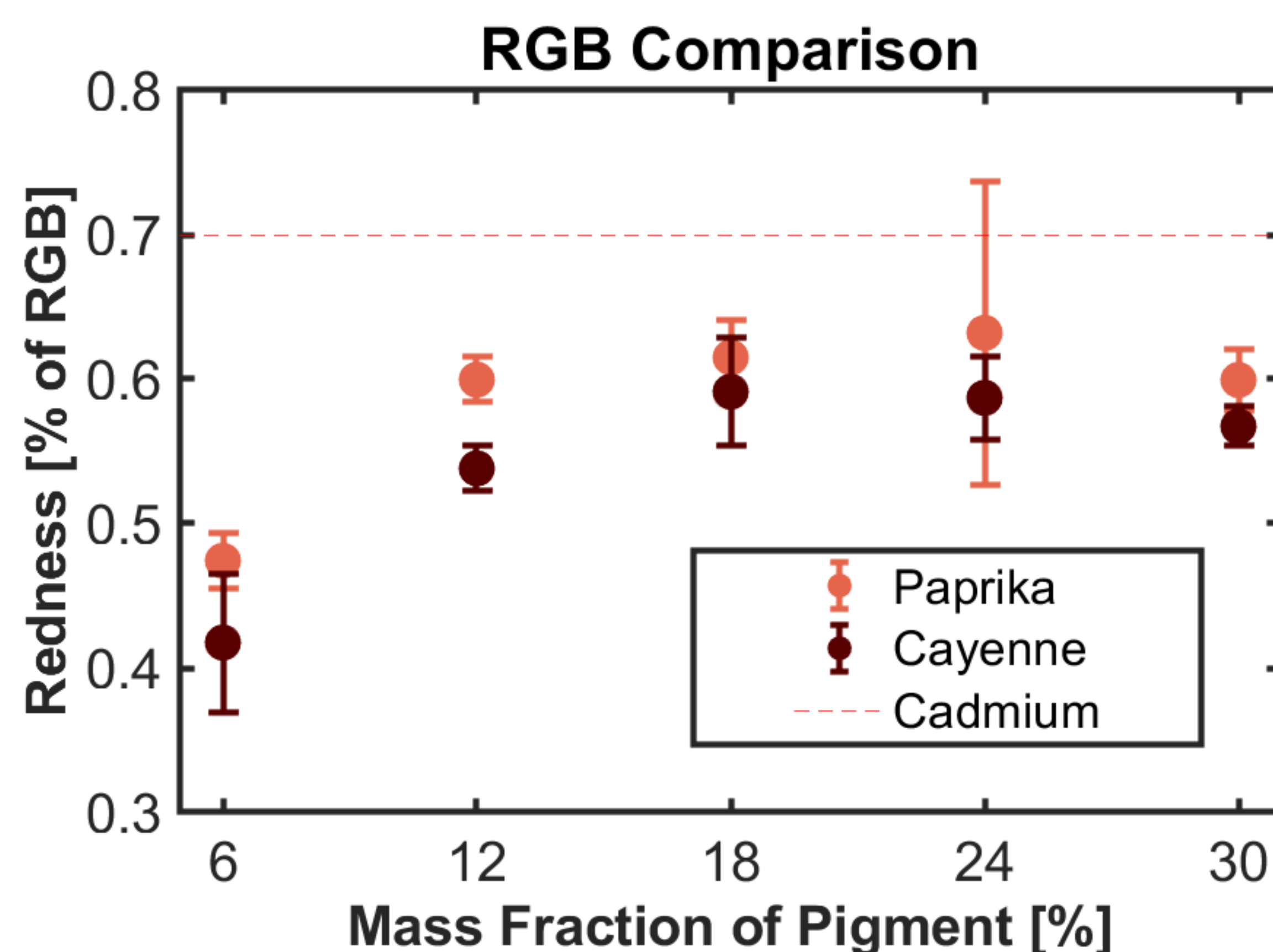
Color



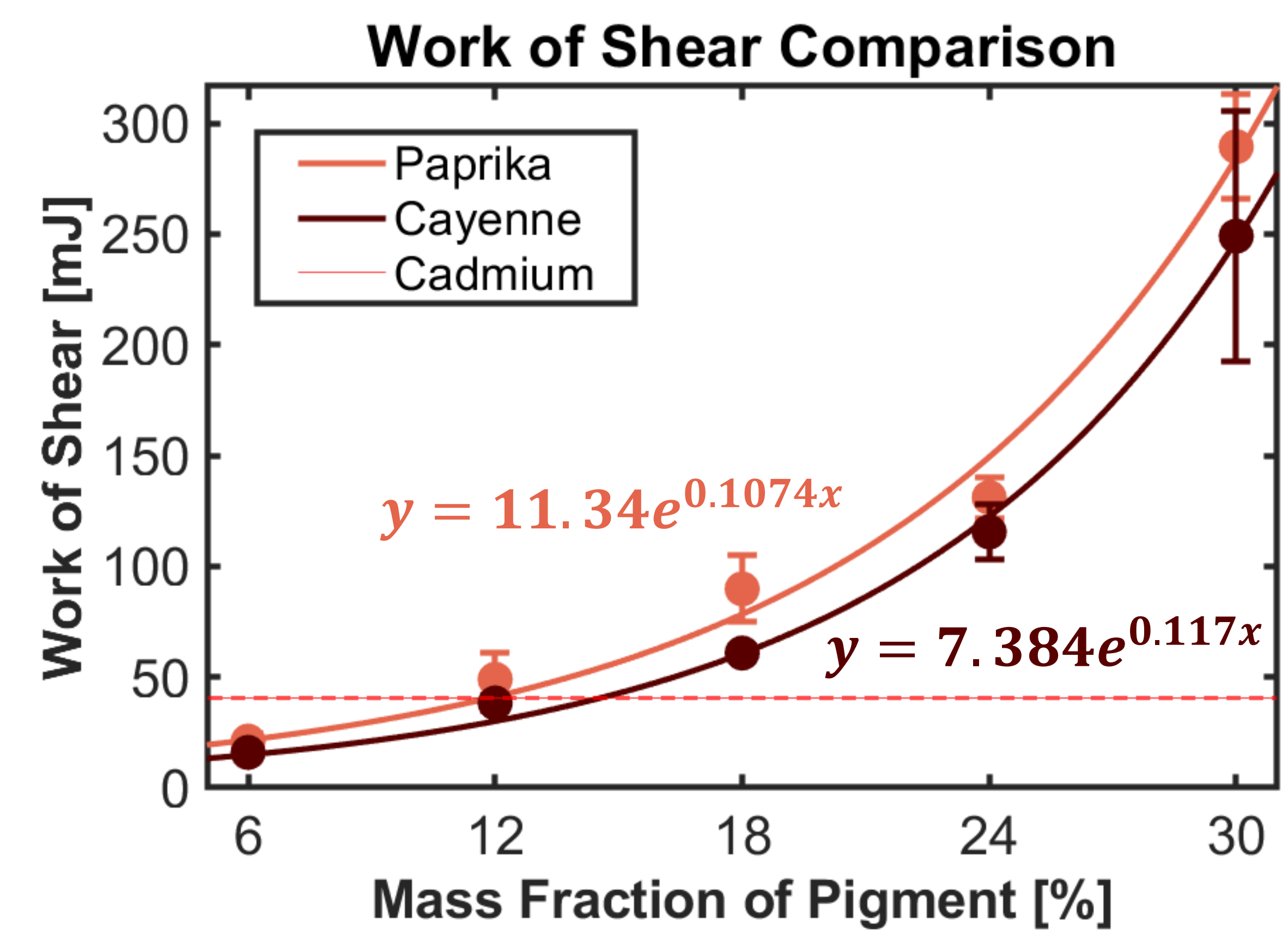
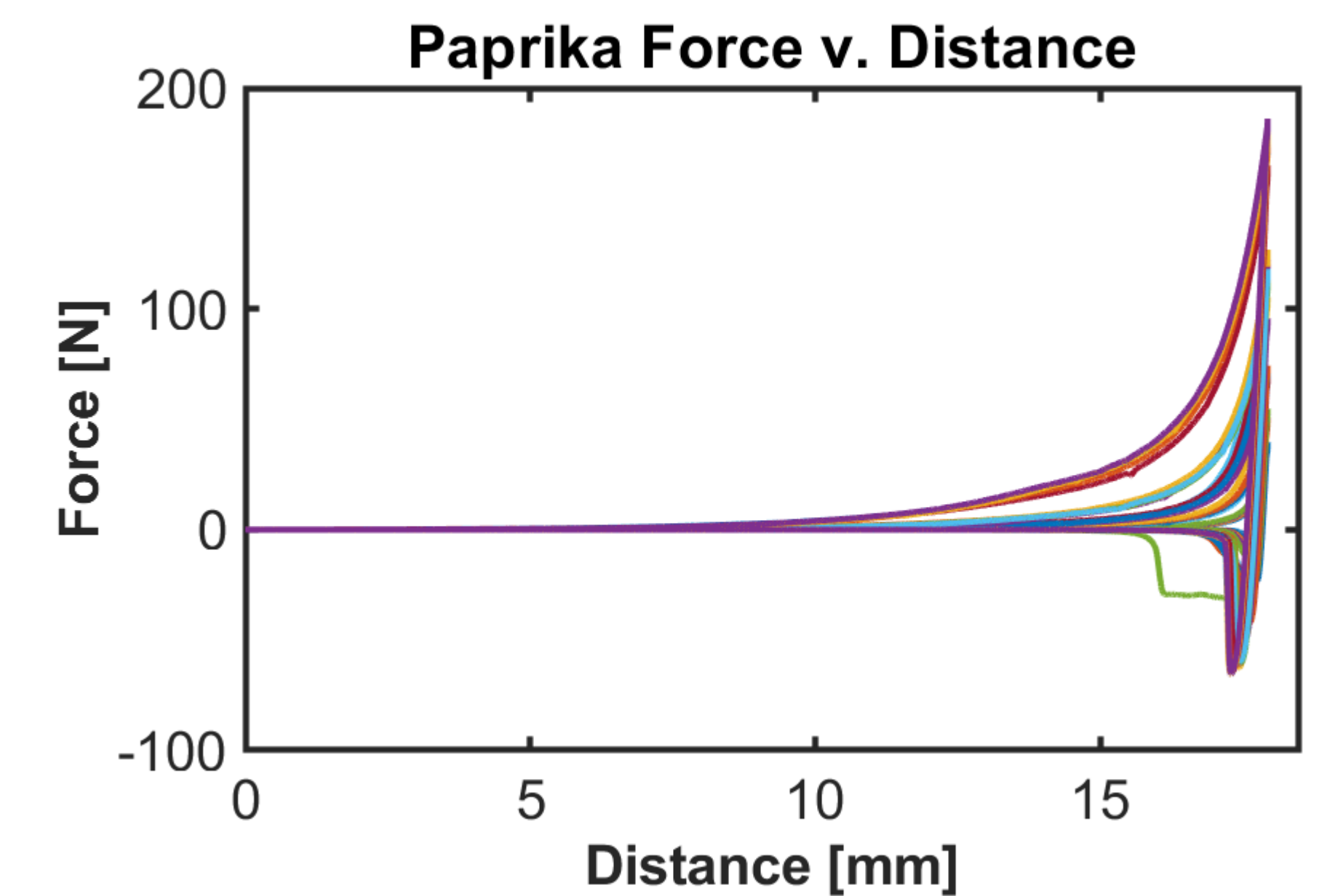
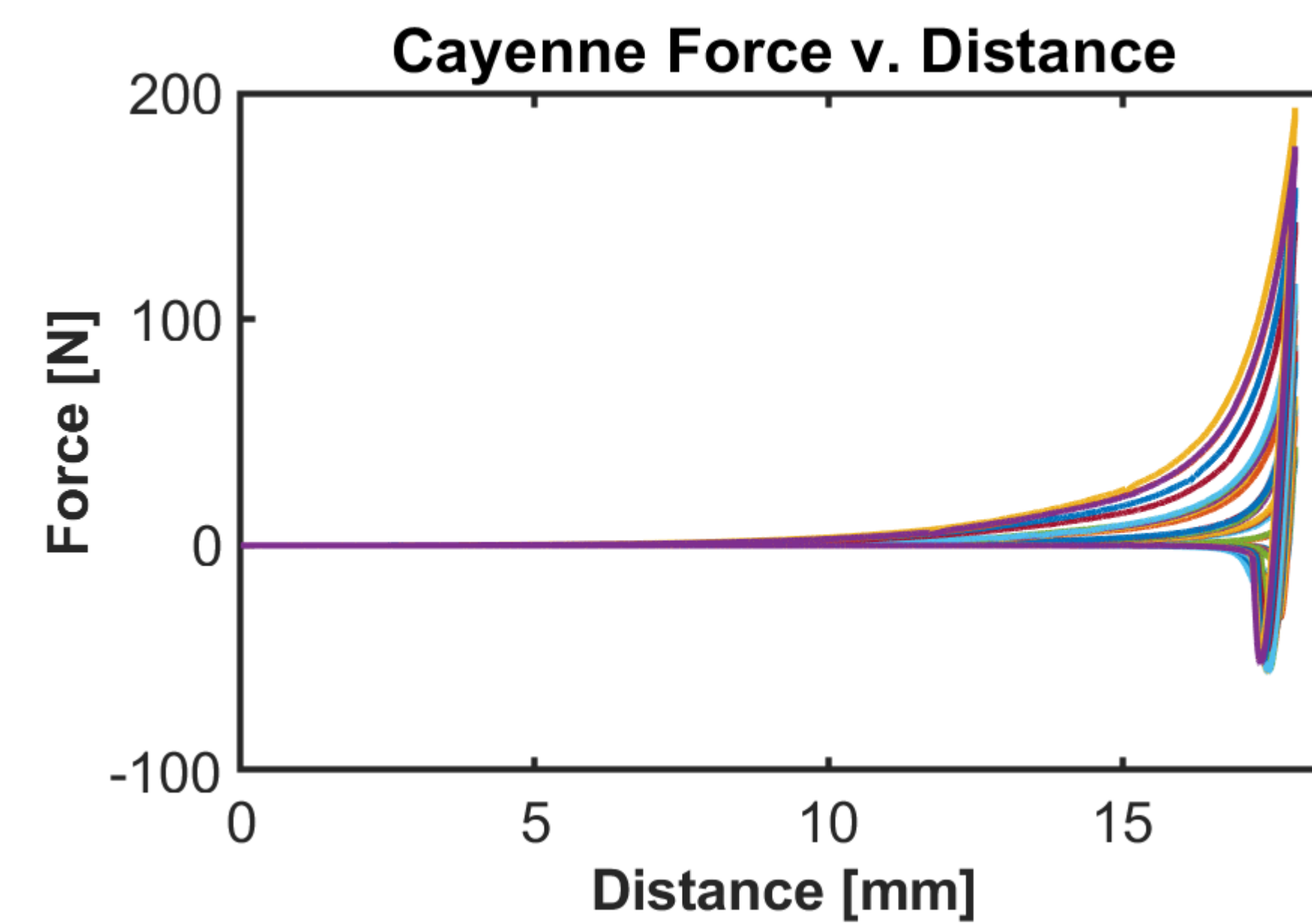
Average RGB



$$R/(R + G + B)$$



Work of Shear



Conclusions

- **Paprika** is consistently **more red** than cayenne (with 95% certainty).
- **Cayenne** consistently exhibits **less work of shear** under compression than paprika (with 95% certainty).
- **12%** pigment concentration is most similar to Liquitex Cadmium Red Deep Hue in terms of **spreadability** for both spice-based paints.
- **18-24%** pigment concentration is **most red** and similar to Cadmium Red for both spice-based paints.
- Future work investigating spice-based paint when pigment is ground to powder may be completed.

Acknowledgements

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