ADVANCES IN CONTACT CLEANING FOR YIELD IMPROVEMENT

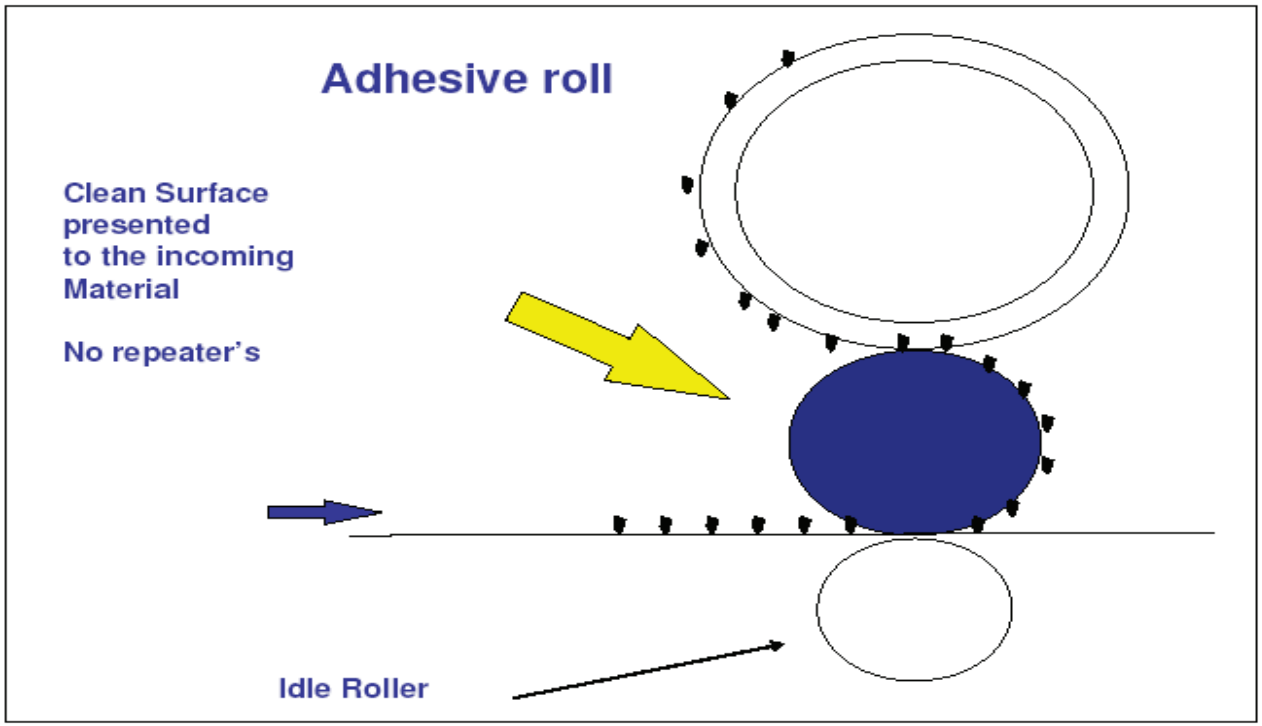
Sheila Hamilton
Teknek Ltd

Outline

- Contact Cleaning Technology
- Elastomer performance
- Research
- Experimentation
- Conclusions

Principles of Contact Cleaning

Figure 1: Contact Cleaning Mechanism



Principles of Contact Cleaning

Contact Cleaning Applications

- Flexible Printed Circuit Boards
- Automotive windshields
- Metallized films
- Medical packaging
- Copper foils
- Hard coated films
- Idler and diverter rollers

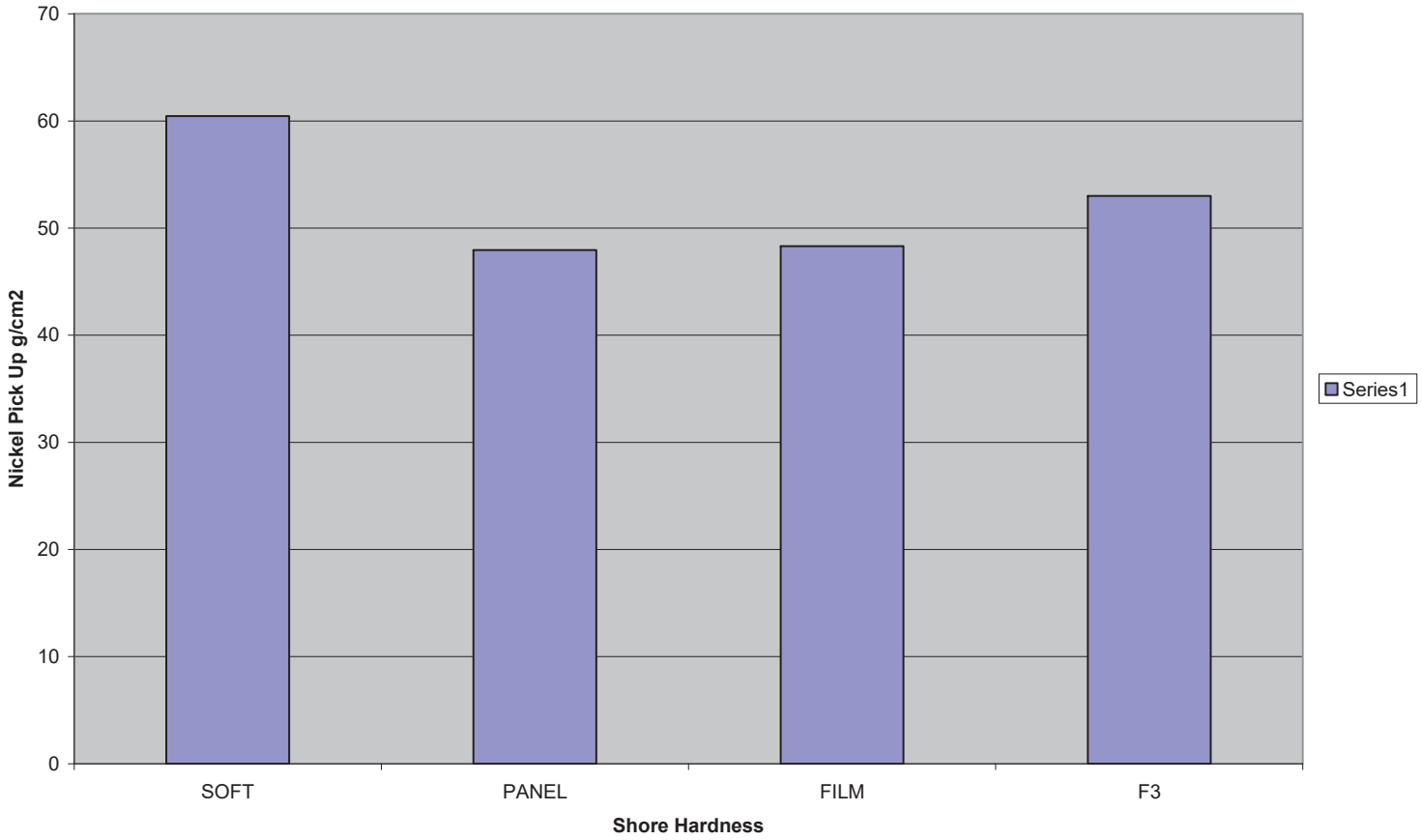
Yield improvements

- Average yield up 15%
- 50% defect reduction in flexible OLED matrices
- 90% defect reduction in printed PV

Teknek Elastomers

- Panel - Rigid substrates
- Film - Film over 250 microns
- F3 - Film under 250 microns
- Soft - High density PCBs

Current Elastomer Cleaning Performance

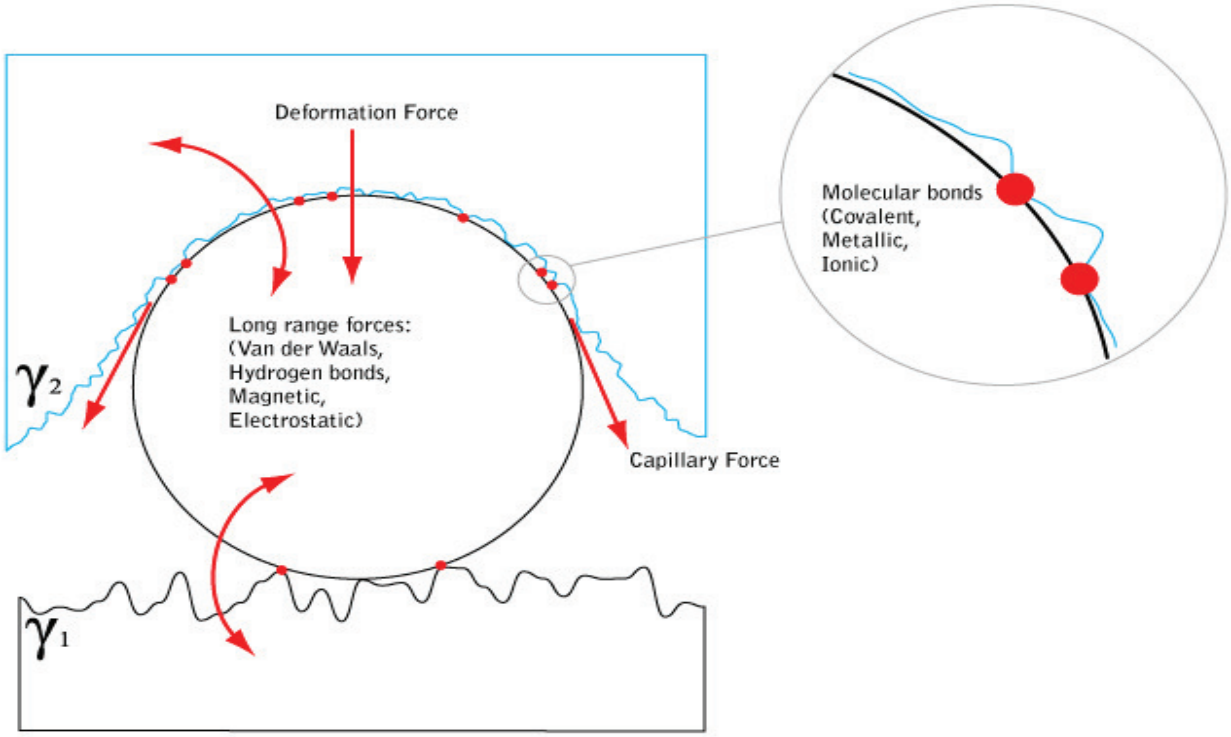


Elastomer Properties

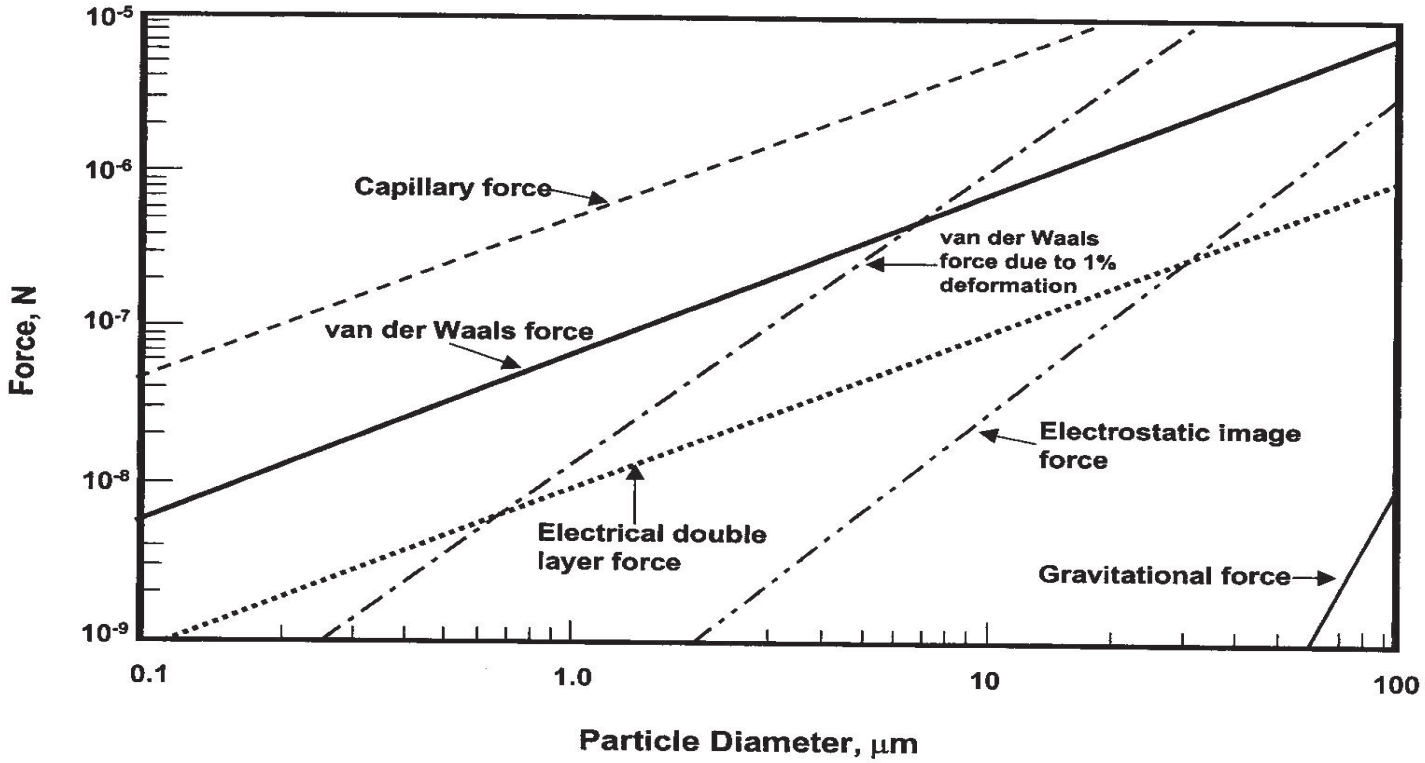
- High cleaning performance
- Remove particles less than 1 micron
- No leaching
- Able to process substrate
- Does NOT affect the charge characteristics of the substrate

Interfacial Forces

Constituitive Adhesion Forces

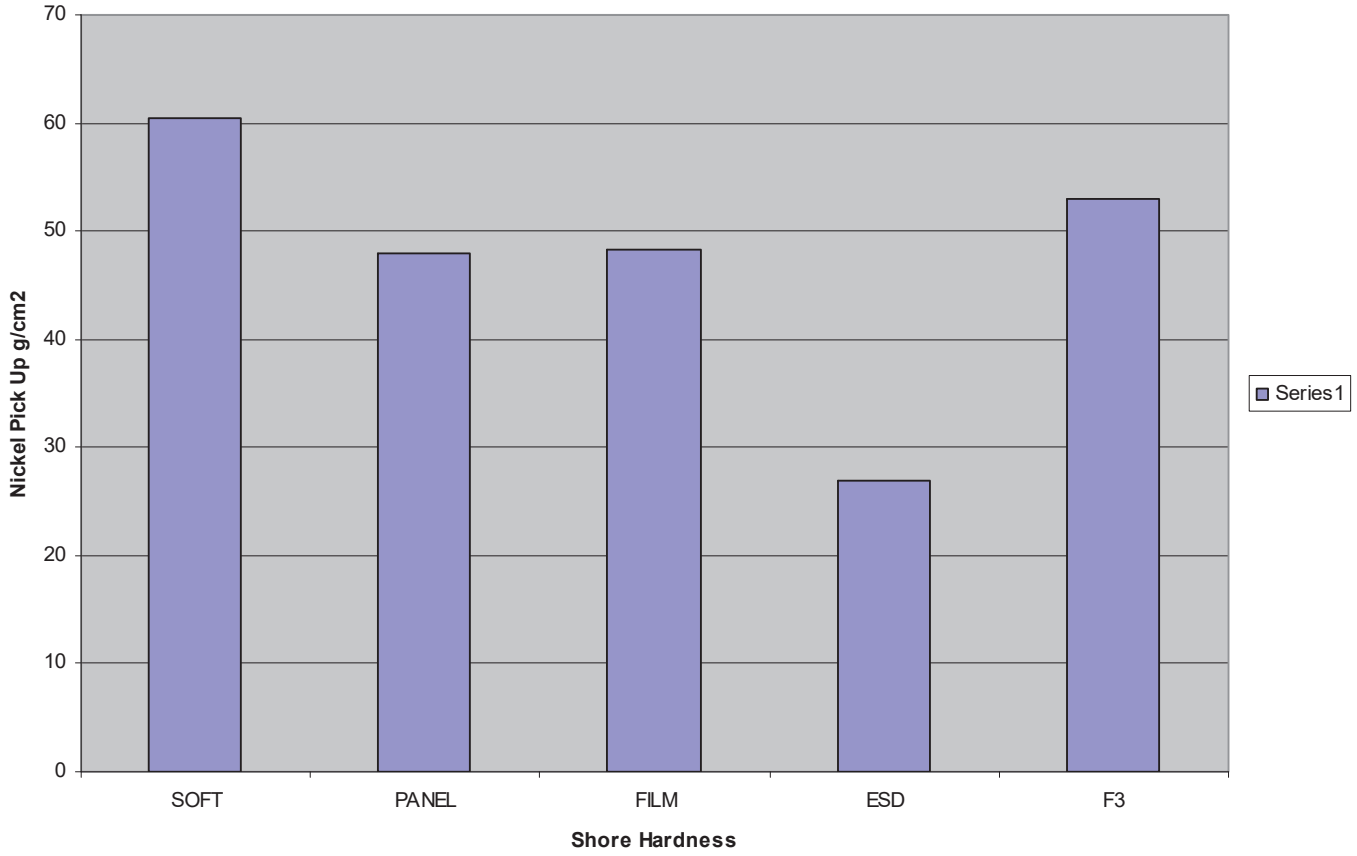


Examples of Adhesion Forces

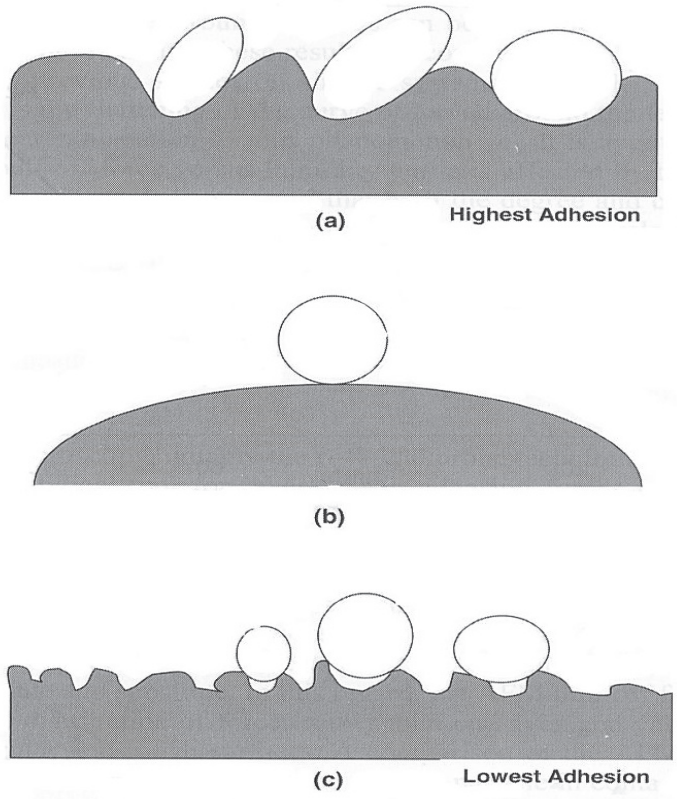


The adhesion forces are shown as a function of the diameter for an Al_2O_3 particle on a Si substrate [20-21, 37].

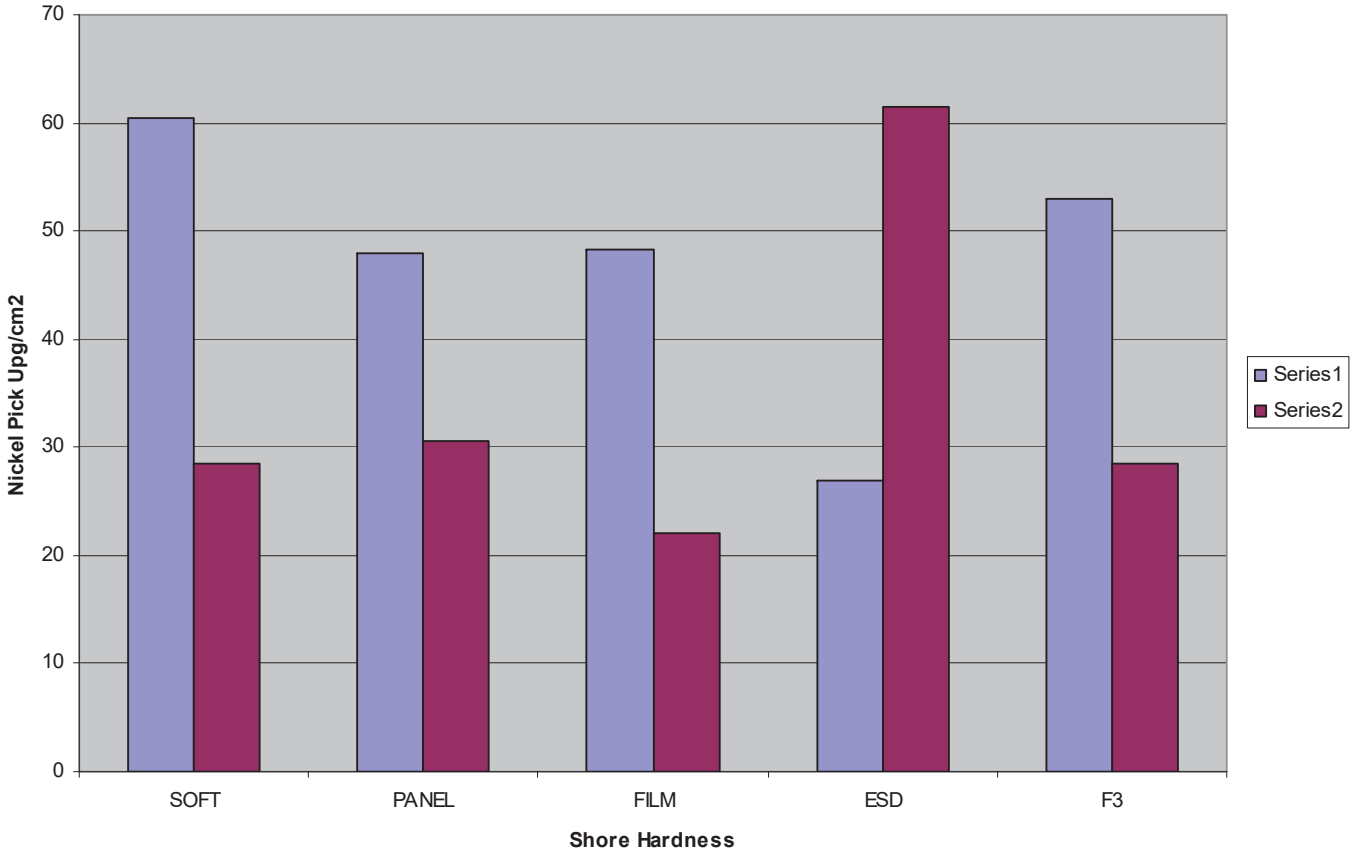
New Elastomer Cleaning Performance



Surface Modification



Surface Modified Elastomer Cleaning Performance



Conclusions

- Standard elastomers work well for current applications
- There is a growing need for removal of smaller particles
- Smaller particles have stronger attraction for microroughened surfaces
- New technique enhances cleaning performance of moulded rollers