



The Static Electricity Protection Method for Packing Materials

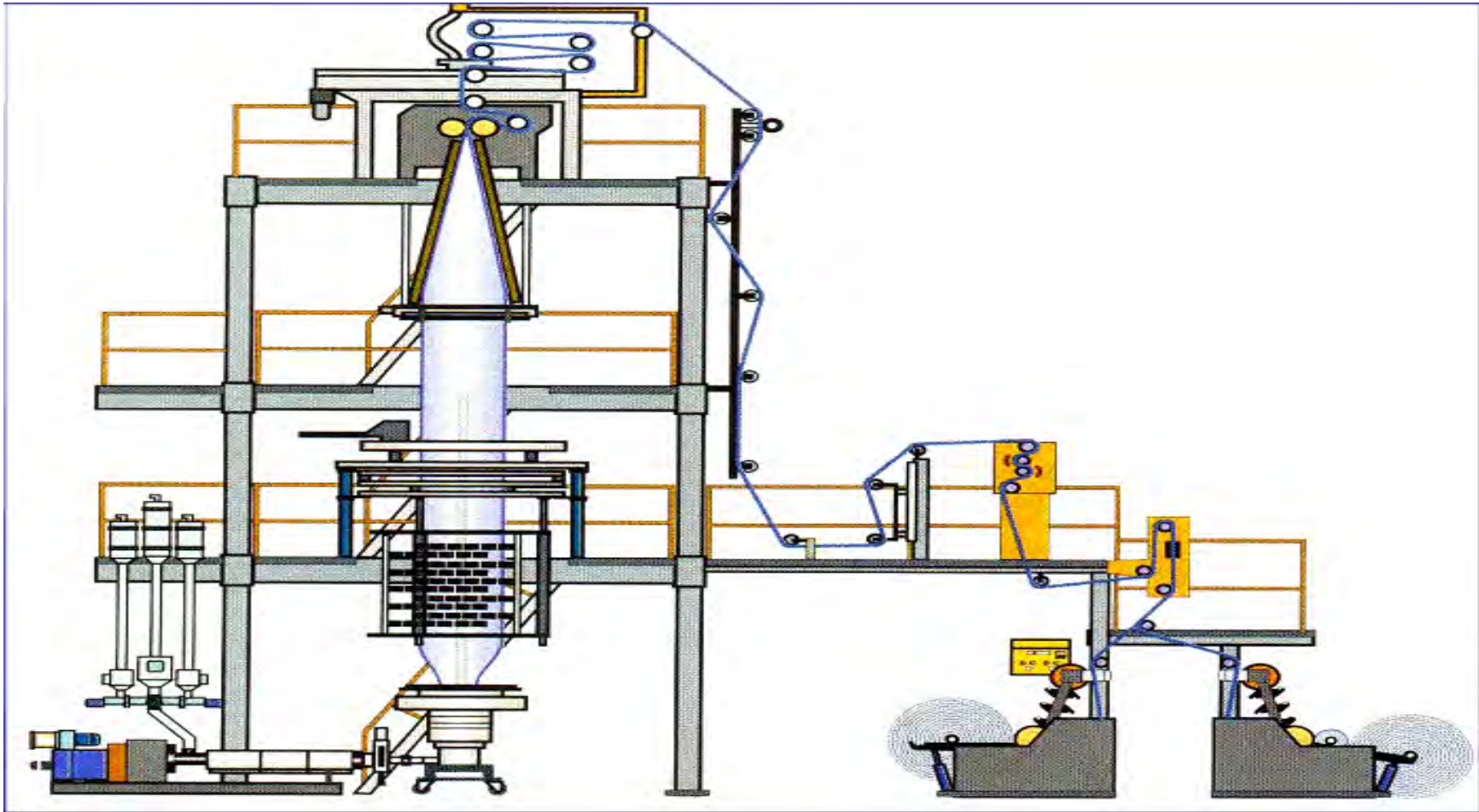
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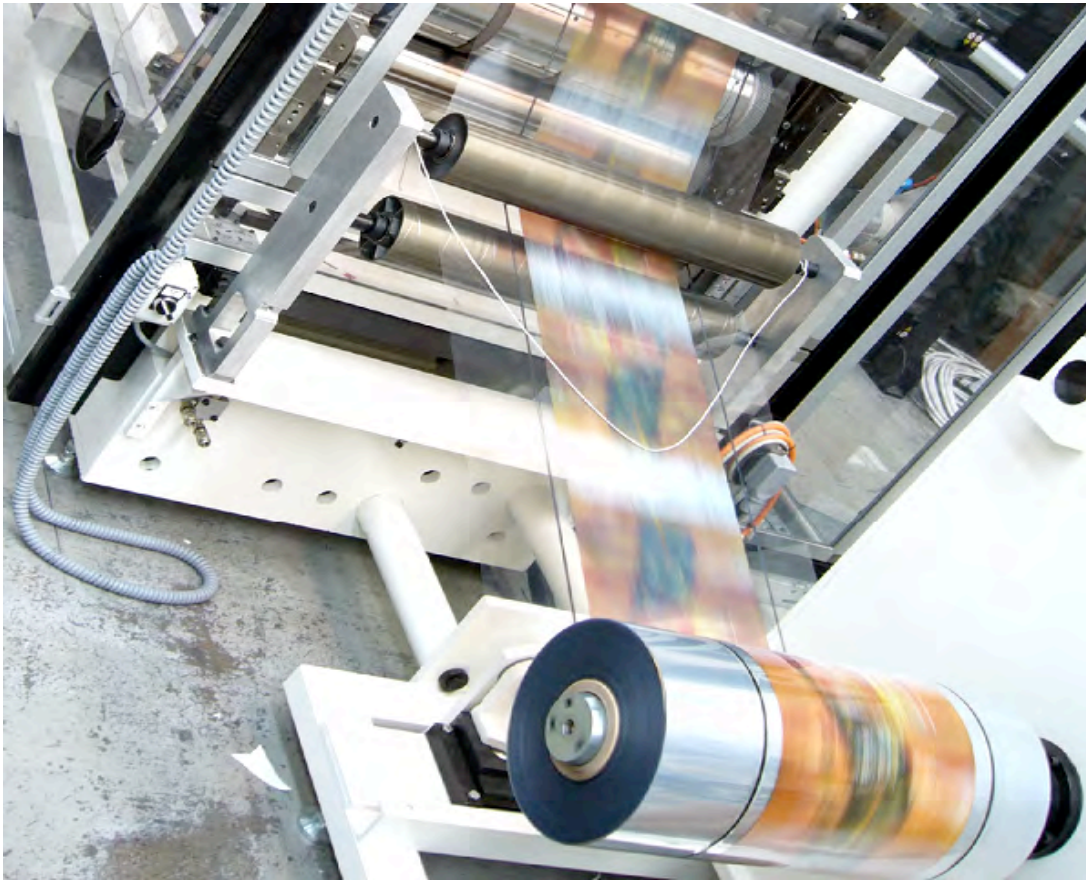
Problem actuality

Negative impact of charge through all stages of pack manufacturing:

- ✓ Polymer film production
- ✓ Printing on polymer film
- ✓ Laminating (or other layers applying)
- ✓ Film cutting for further pack processing
- ✓ Packing of goods



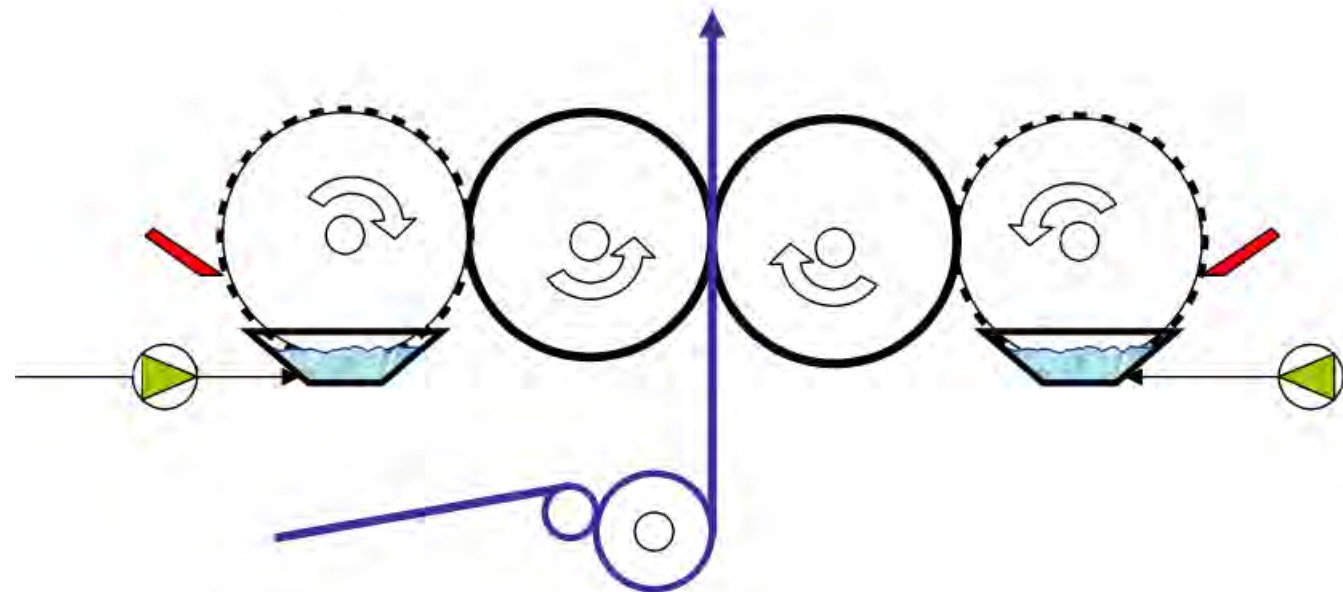
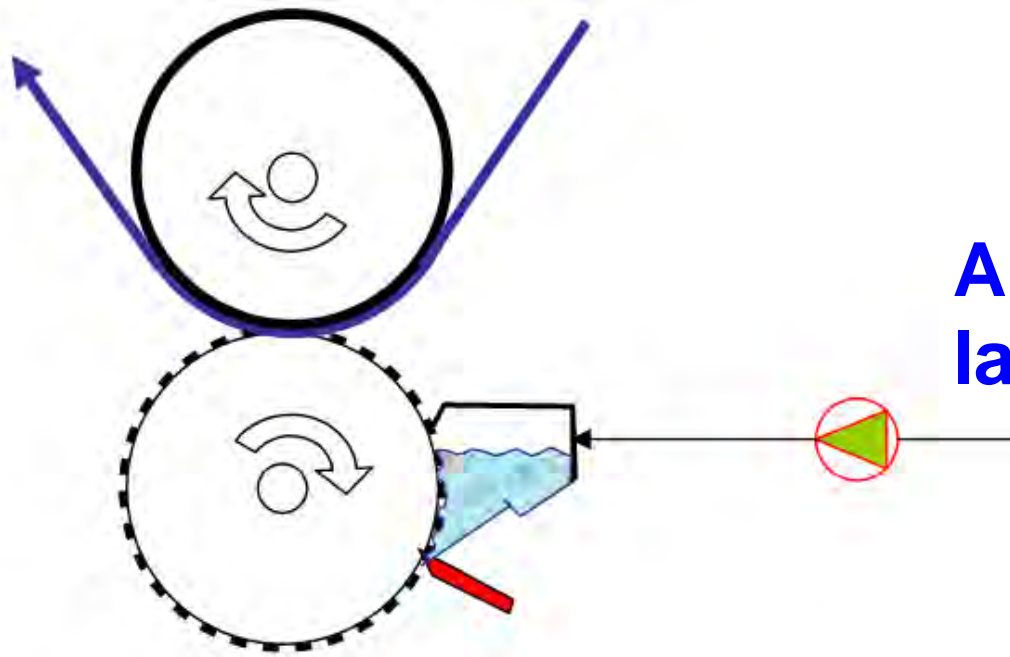
**Equipment for polymer film producing
“blow” method**



Flexography printing process



Applying of additional layers on polymer film

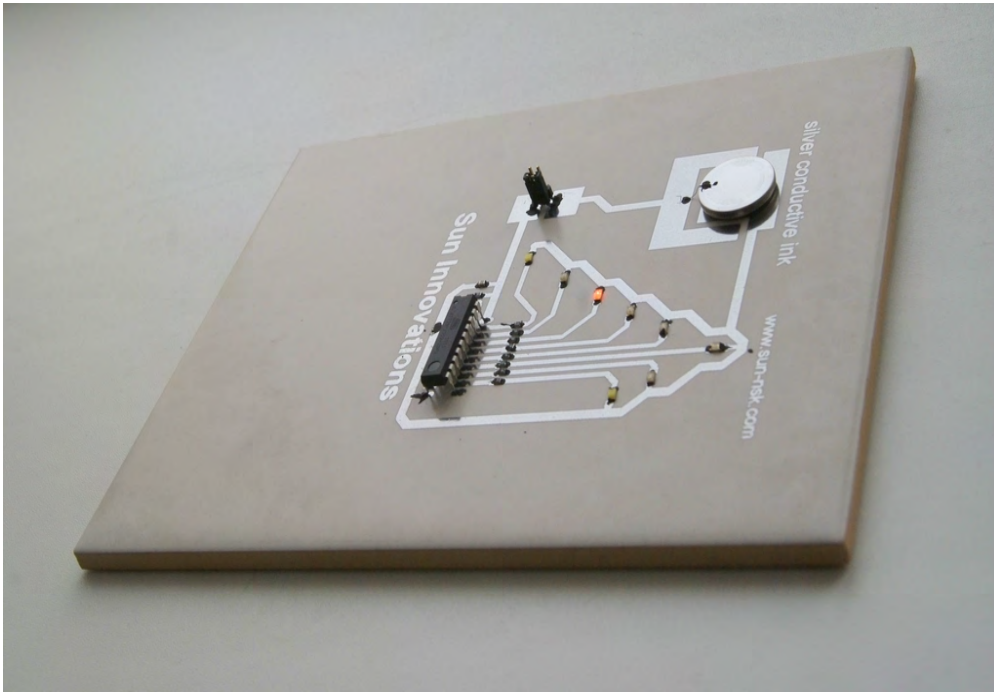




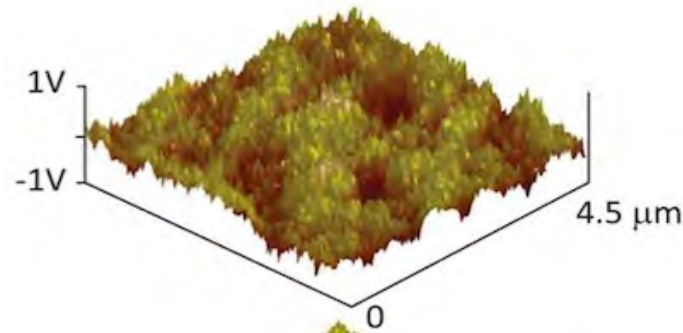
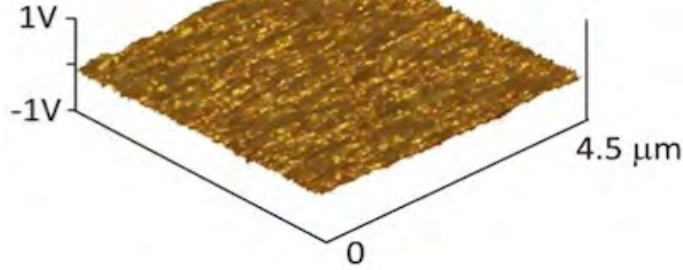
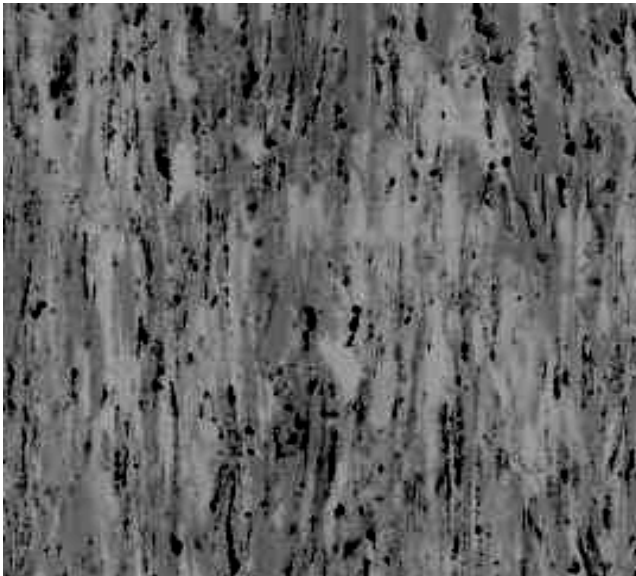
Film rolling and blocks cutting



Product packing machine



Printing of conducting microelements



Uneven electric charge distribution



**Eelectrization in
work rooms**

**Light-striking of
photomaterial
because of electric
charge**



Polymer films for experiment

Type	Thickness, μm
Polyethylene (PE)	30
Polypropylene (PP)	20
Polyethylene (PET)	25

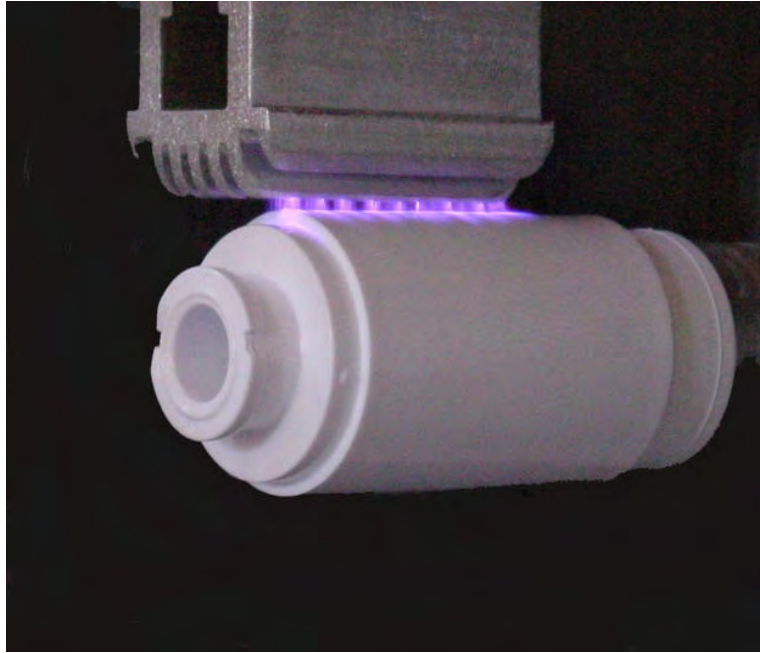
Anti-electrostatic composition - water disperses of copolymer methymethacrylate and maleic anhydride.

Percentage of copolymer 5 – 20%.

Polymer particle size in dispersion 2 – 2.5 microns.

Proof press FlexiProof 100





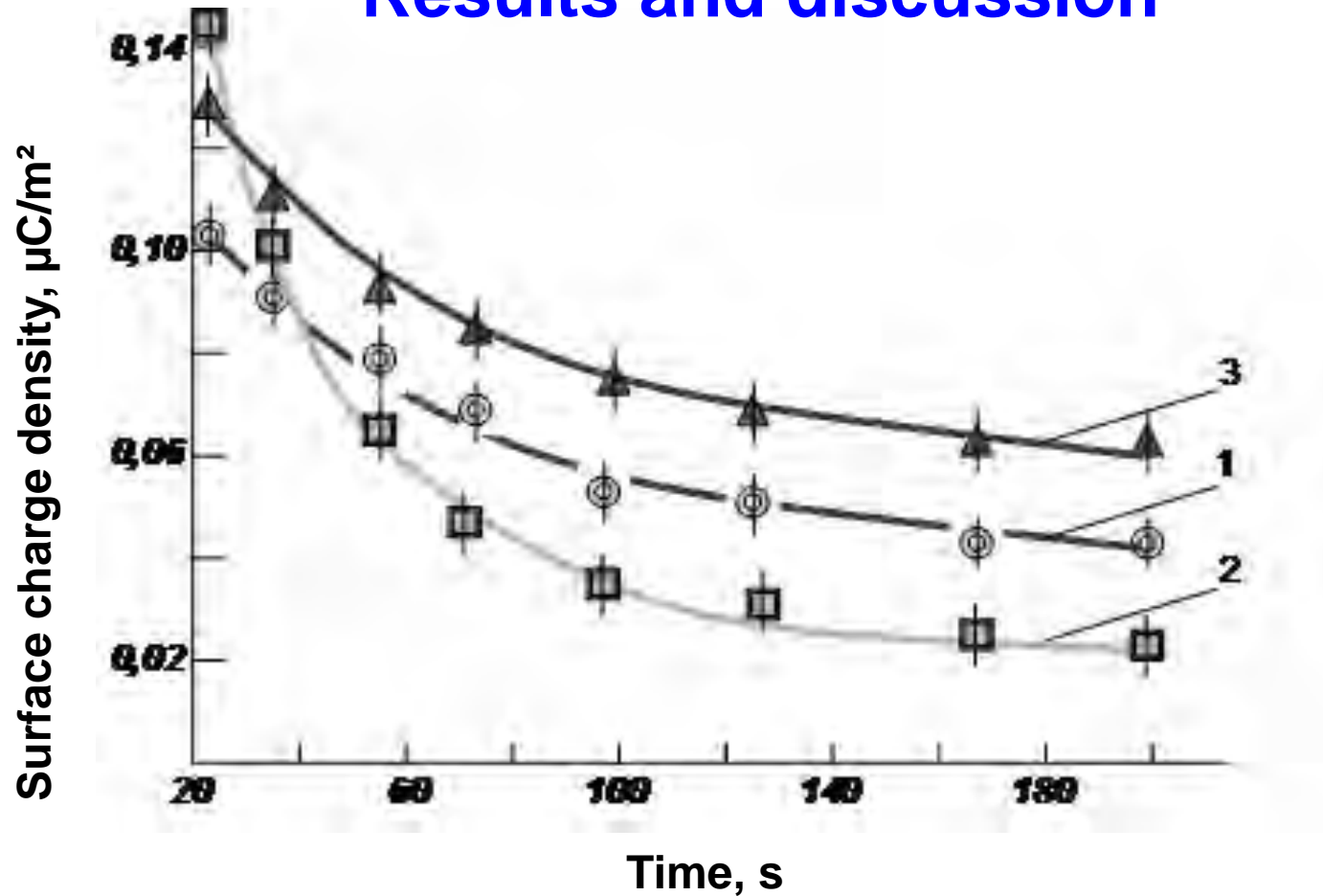
Corona charge

**Electric field
parameters
tester**

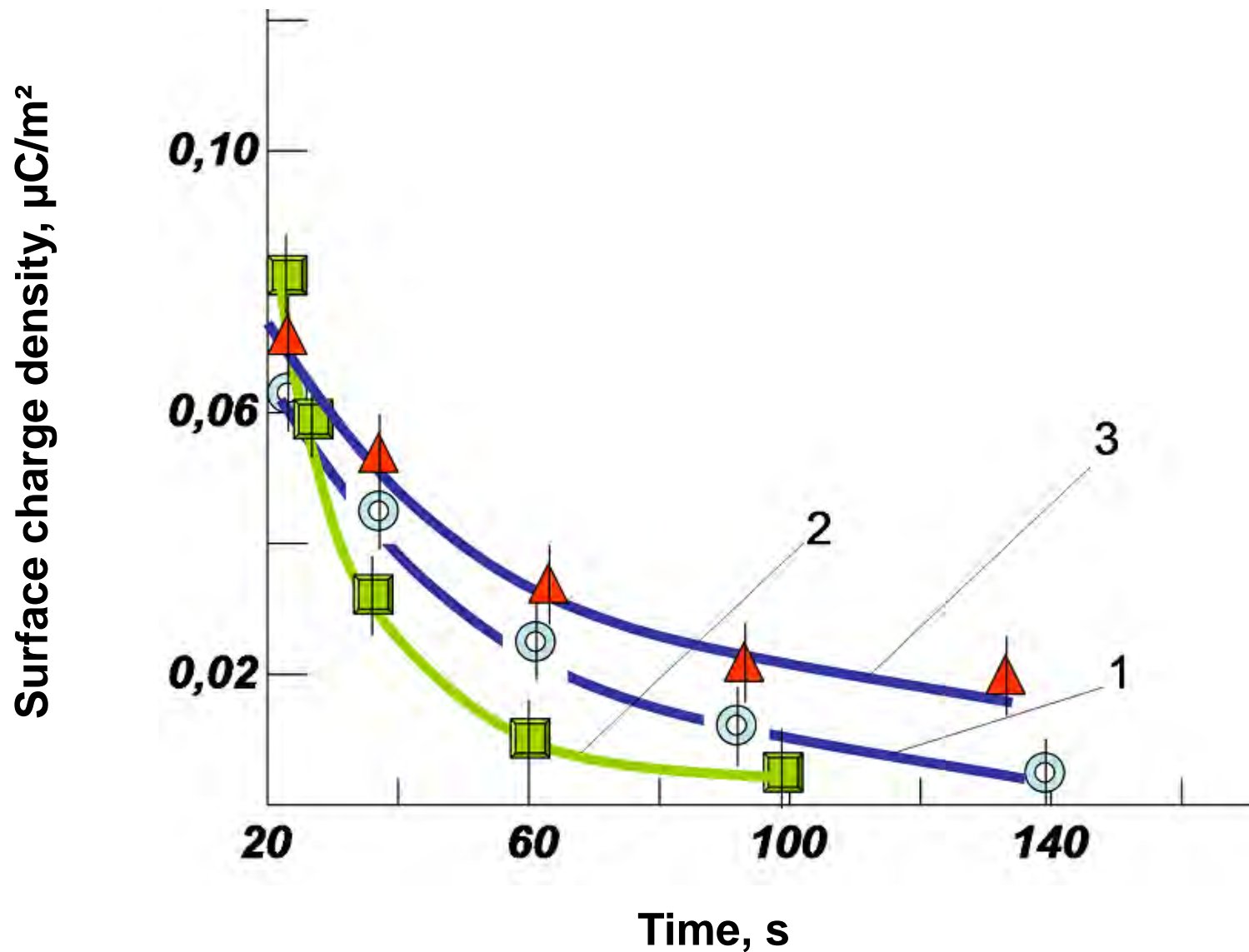


**Polarizing optical
microscope
“Polam-P312”**

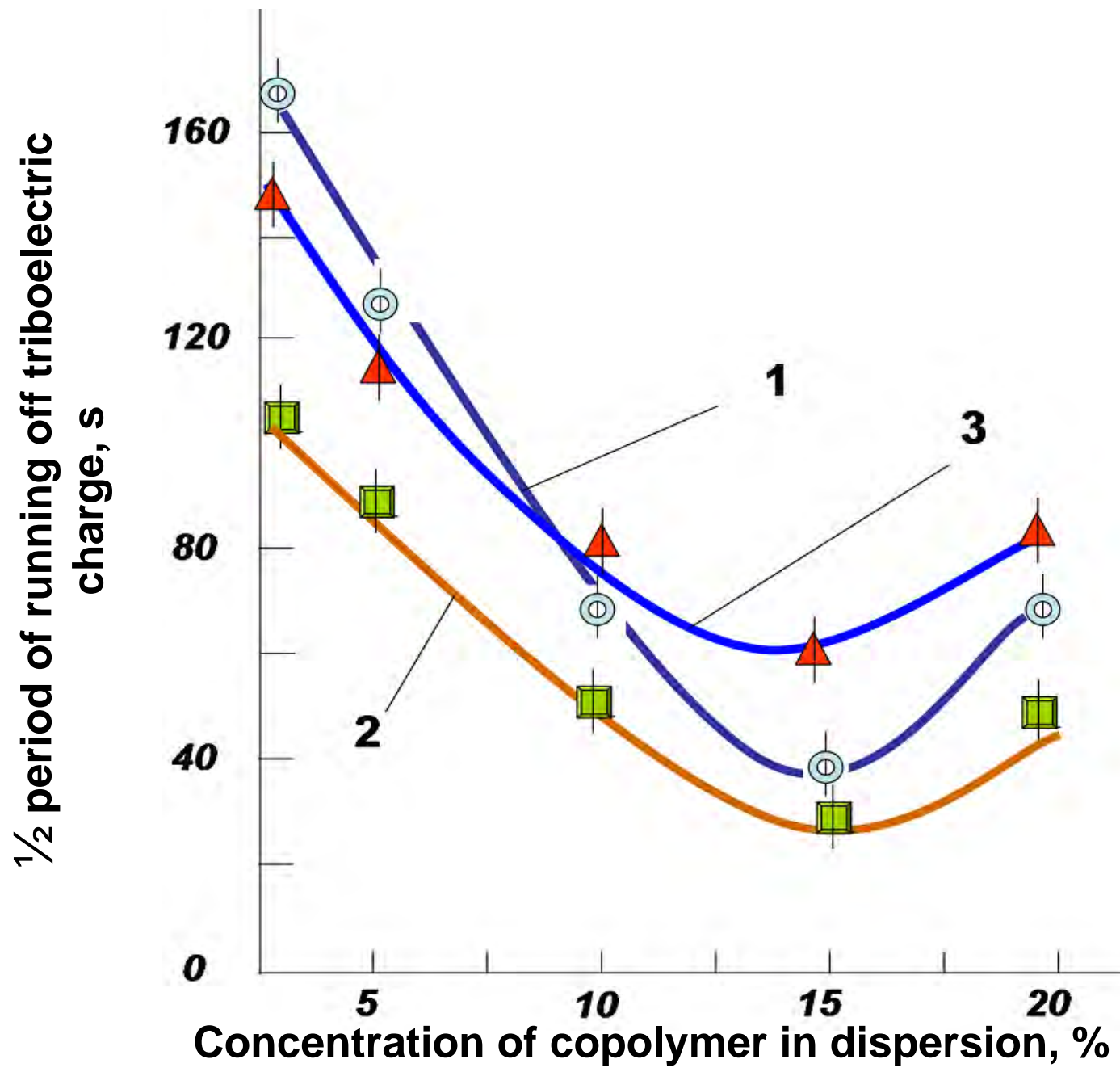
Results and discussion



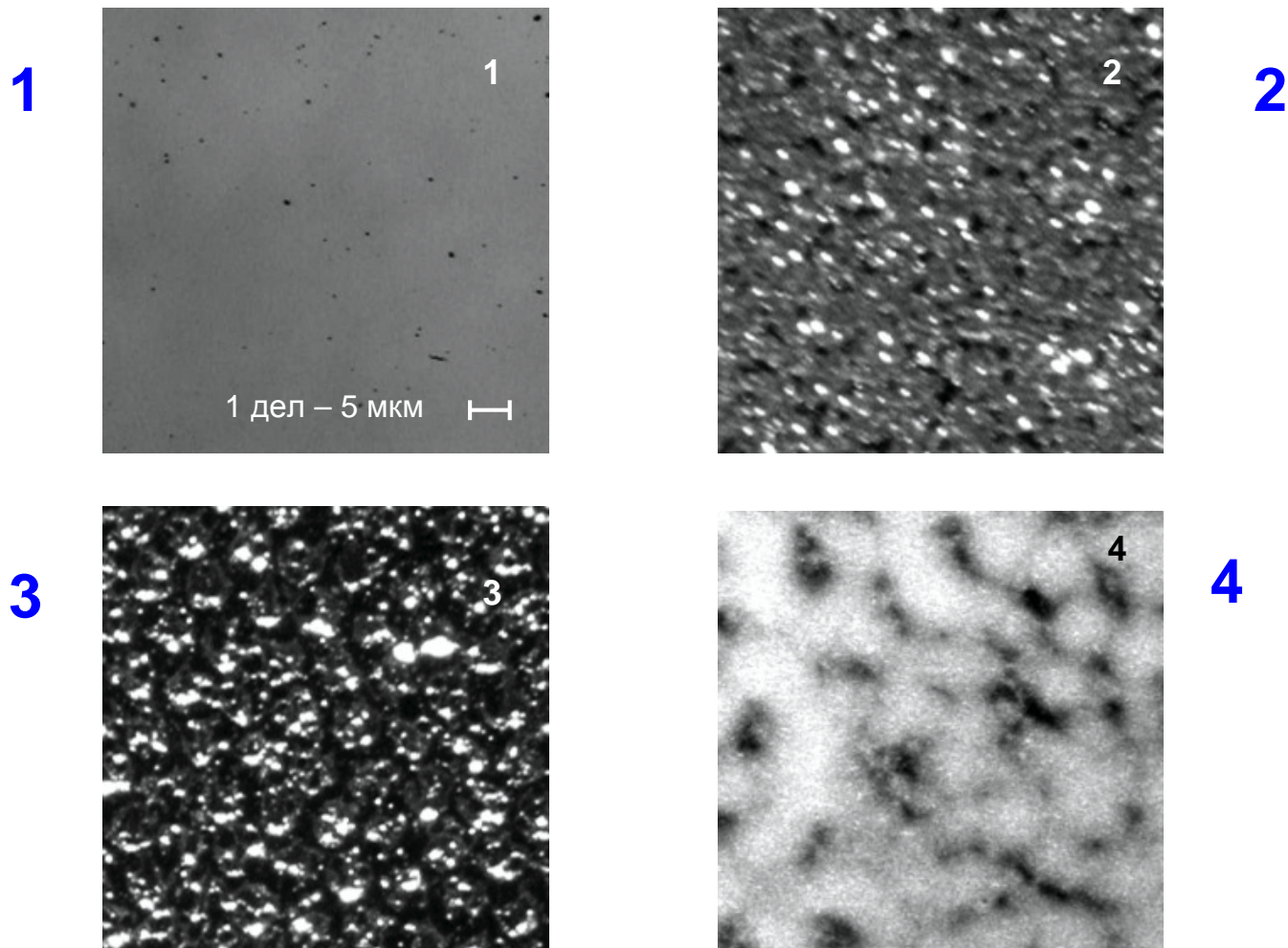
Changes of triboelectric charge with time for samples of PP (1), PET (2), PE (3) films, electrified by vinyl polymer roll.



Change of triboelectric charge in time for PP (1), PET (2) and PE (3) films with the layer of copolymer (concentration of copolymer in water dispersion is 5%), electrified by plastic roll



PP (1), PET (2), PE (3)



Micro photos of surface of samples PET film:
1 – original film without copolymer layer
films with copolymer layer, dispersion concentration,
2 – 10%, 3 – 15%, 4 – 20%

Conclusions

- Based on experimental results it is recommended to apply water dispersion of copolymers as an additional step in technology of making polymer pack. The aim is reduction of triboelectrization of polymer pack
- It is necessary to make an experiment for investigation of influence of chemical nature of copolymer in water dispersion. It will assist to find the most optimal variant of dispersion for protection against electrostatic charges



**Thank you for your
attention!**

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