Characterization of the silver halide printing plate's surface properties

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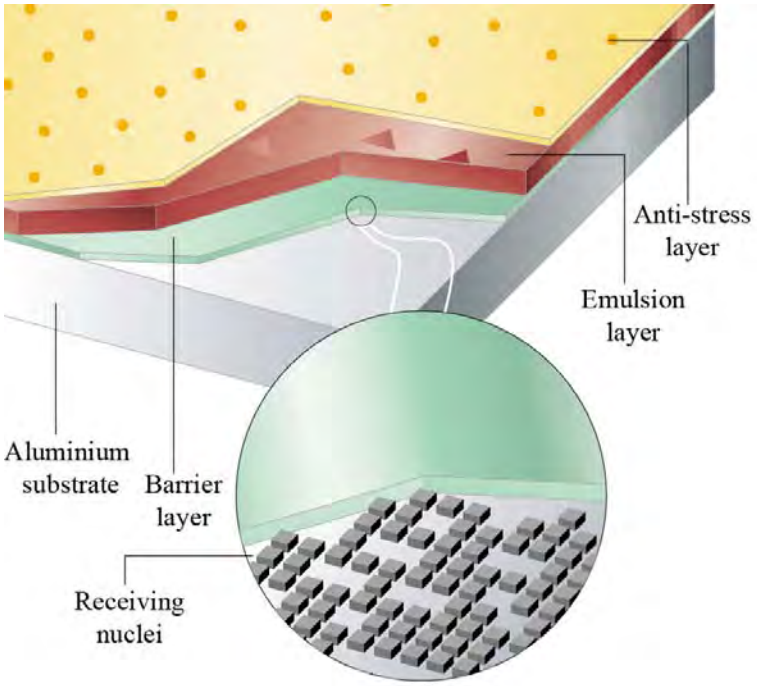
- Introduction
- Materials
- Methods
- Results
- Conclusions

Introduction

- Printing plate
- Non image areas
- Post exposure treatment
- Aim of the research

Materials

- AGFA Lithostar LAP-V – a positive working silver-halide (AgX) layer



Materials

- Plate making process
  - Exposure
  - Developing
  - Diffusion
  - Wash off

Materials

- Printing
  - web offset GOSS Universal 70 printing press
  - paper for newsprint, weight of 45 gm^{-2}
  - coldset printing inks
  - print run of 80.000 imprints

Methods

- Electrical conductivity

Methods

- Contact angle
  - Measured by Dataphysics OCA30

Enables surface free energy calculation

Indicates wetting of the solid with defined liquid

Methods

- Surface free energy
  - Calculated by OWRK method

$$\frac{(1+\cos\sigma)*\sigma_s}{2\sqrt{\sigma_l^D}} = \sqrt{\sigma_s^P}\sqrt{\frac{\sigma_l^P}{\sigma_l^D}} + \sqrt{\sigma_s^D}$$

  - Used liquids: water, diiodomethane, glycerol

Methods

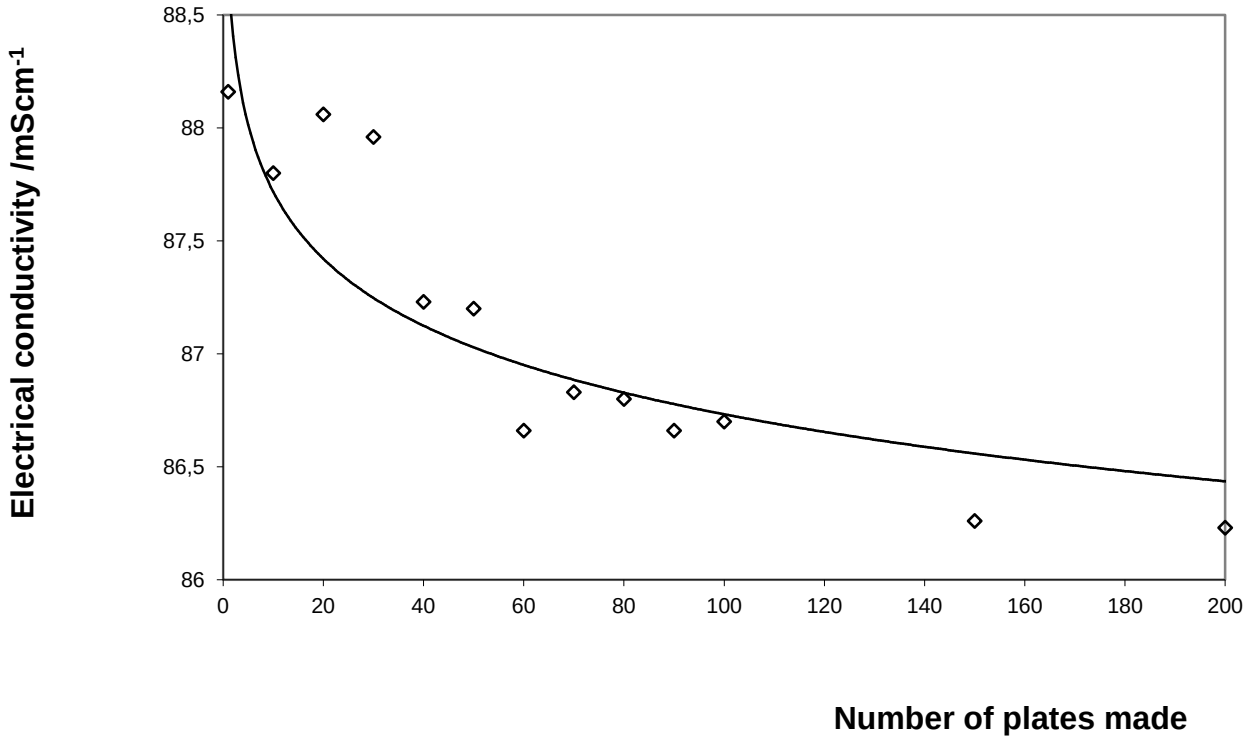
- Surface roughness
  - Measured by Portable Surface Roughness Tester TR200

Methods

- Image area geometry
  - Measured by Gretag Macbeth iCPlate II Platereader

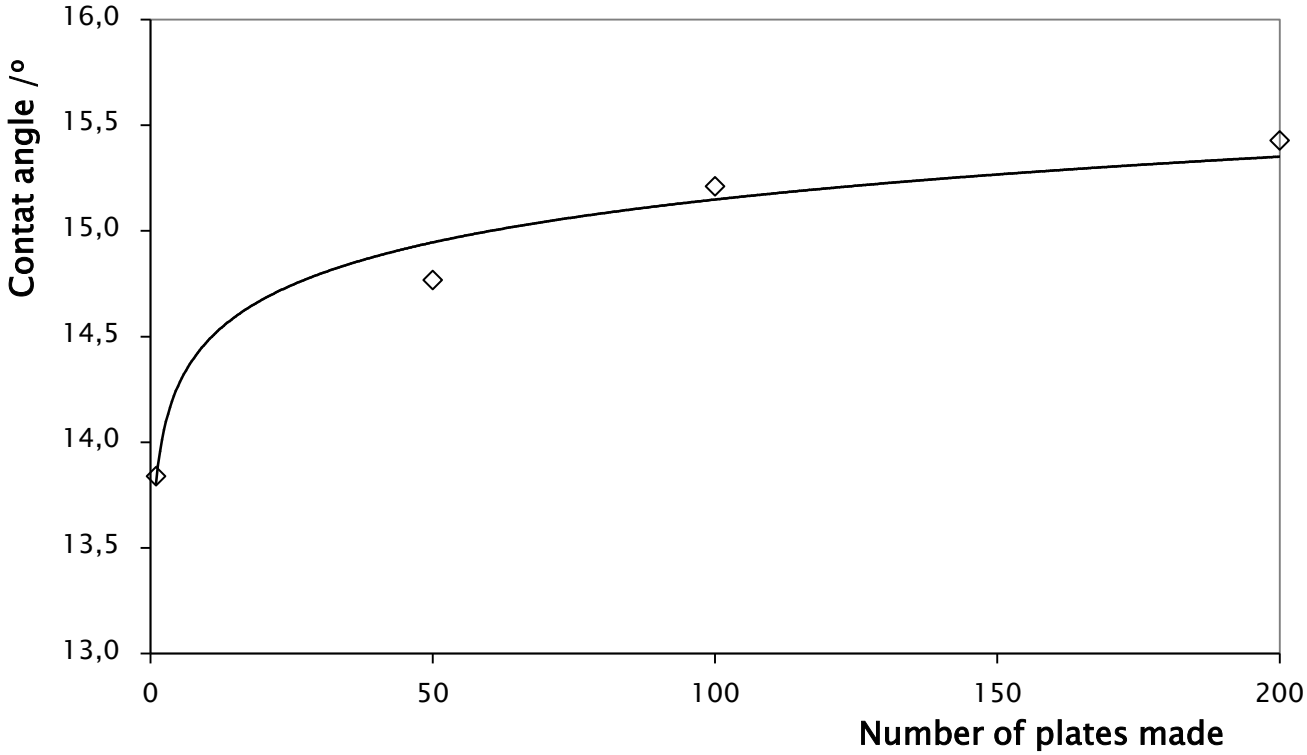
Results

- Processing solution ageing



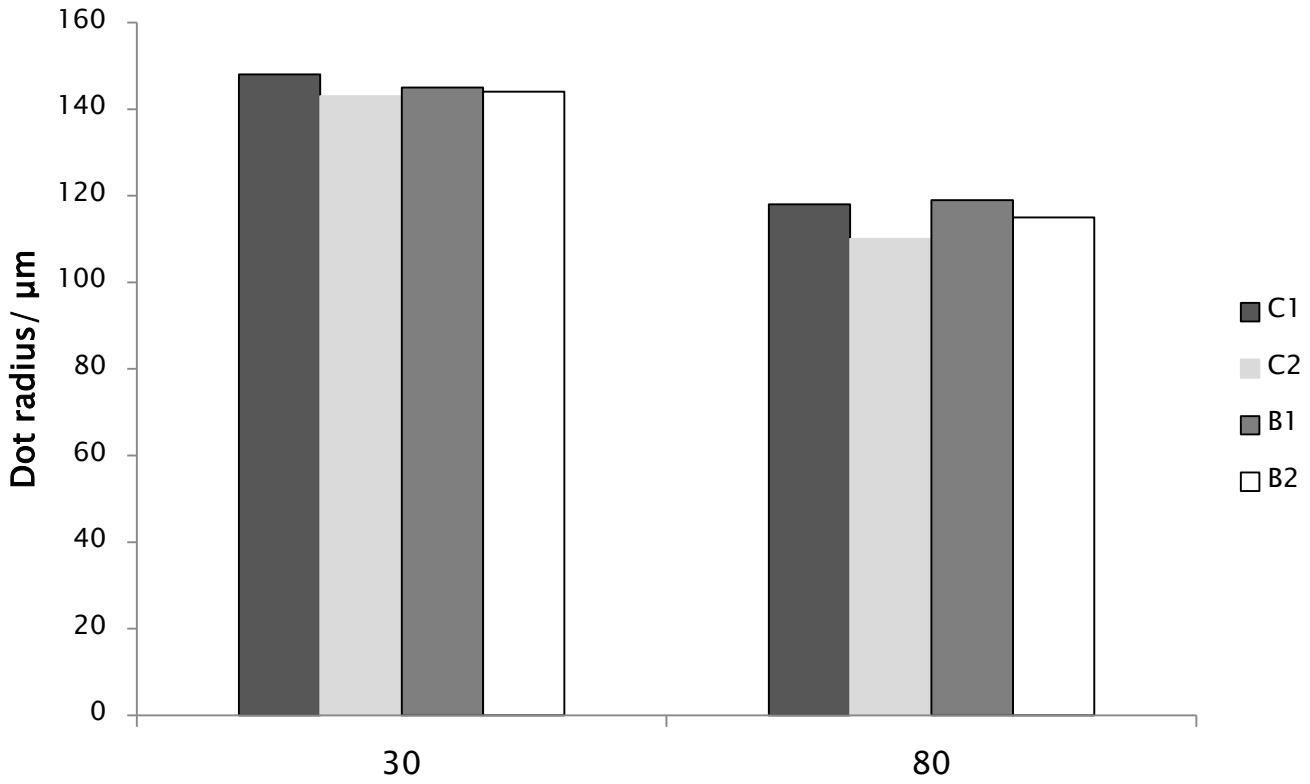
Results

- Processing solution ageing



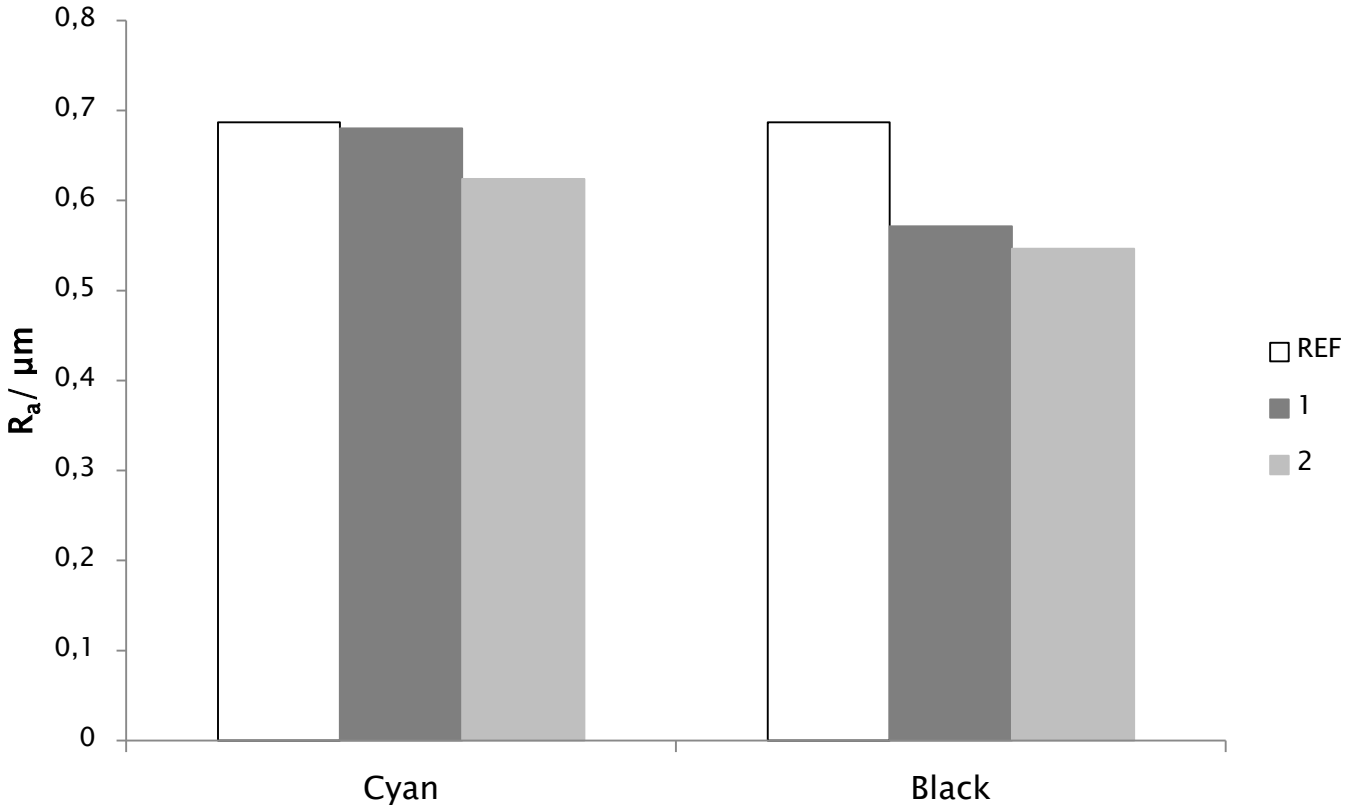
Results

- Printing process influence



Results

- Printing process influence



Results

- Printing process influence

	Surface free energy [mN/m]		Dispersive part [mN/m]		Polar part [mN/m]	
	before	after	before	after	before	after
Cyan pp	60,3	53,79	30,92	25,59	29,38	28,21
Black pp	59,96	50,54	29,62	26,42	30,35	24,11

Results

- Printing process influence

	Contact angle [deg]	
	before	after
Cyan pp	10,3	20,4
Black pp	10,2	27,5

Conclusions

- processing solution changes it composition and results with negative consequence on the nonprinting areas' functionality
- process causes decrease of the coverage value in the lower coverage area but increases in the higher coverage area
- surface free energy of the nonprinting areas decreases with number of prints made, causing higher contact angle with fountain solution

Thank you for your attention!