

DECONTAMINATION OF PCB CONTAMINATED EQUIPMENT USING INT PAT- ENTED TECHNOLOGY FOR SIMULTANEOUS DECHLORINATION, DESULPHUR- IZATION AND REGENERATION OF MINERAL INSULATING OILS

Implementation period: 2015-2022

More than 2600 tons of equipment decontaminated

Location: Republic of Serbia, Power sector, Industry

PCB in electrical equipment

PCB decontamination process aligned with National plan for the implementation of Stockholms Convention to eliminate PCB in Republic of Serbia.

INT patent (RS 53510): PCB removal down to 1 ppm, oil regeneration and removal of corrosive sulphur, in accordance to IEC standards.

Stockholm convention

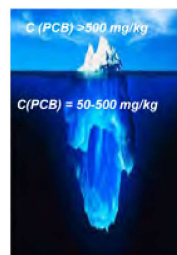
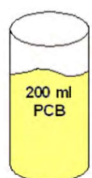
PCB limit - 50 mg/kg in electrical equipment in service

New electrical equipment and oil – PCB free

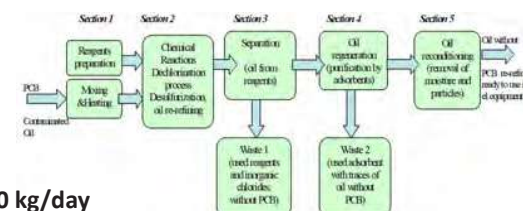
Sources of PCB contamination

Treatments and oil change (common tanks, machines for oil treatment)

Transformer repair (workshops, factories, tanks)



Mobile unit for PCB decontamination and process flow diagram



capacity: 1500-2000 kg/day

Sections

Section 1: heating&reagent preparation

Section 2: Chemical conversion

Section 3: Separation

Section 4: Regeneration with adsorbents

Section 5: Final treatment (oil reconditioning) – drying, filtration, degassing



Reactor and separator



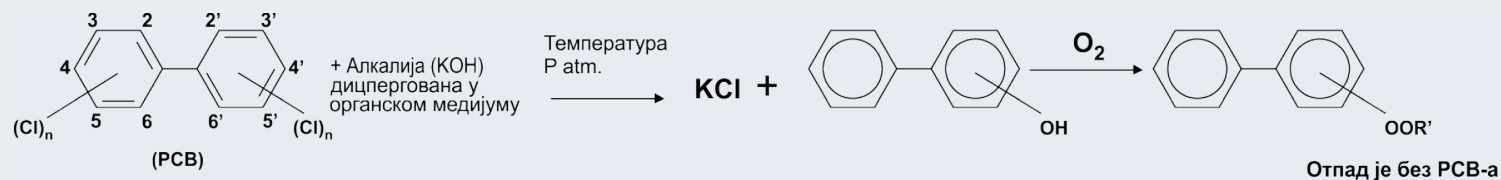
Adsorbent and columns



Oil reconditioning machine

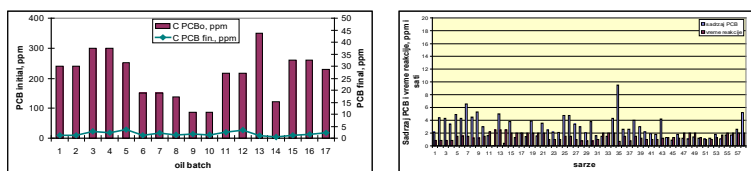
Removal of PCB, corrosive sulphur and oil ageing products
Improvement of oil properties after treatment

Chemical reactions



PCB conversion

PCB conversion and reaction time was optmized through continous on-site measurements



PCB on-site measurements



PCB test kit – Chlrine content in the oil LDX Analyzer



Breakdown voltage



Dielectric dissipation factor



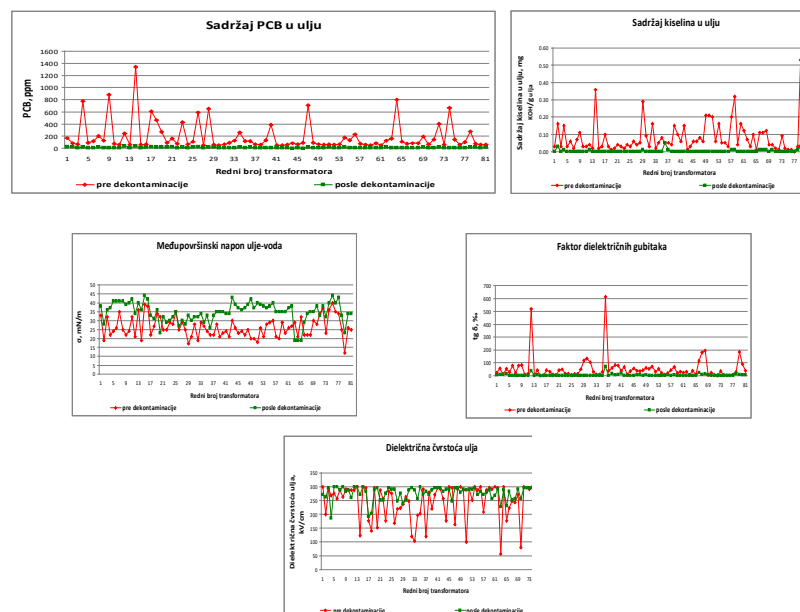
Interfacial tension

PCB measurements in the laboratory



GC ECD - acc. to IEC 61619

PCB decontamination results



CONCLUSION

- INT process is efficient in the removal of PCB, corrosive sulphur and oil ageing products from mineral insulating oils and can be used for efficient decontamination of PCB contaminated equipment, aged oils oil regeneration and desulphurization, i.e. Removal of corrosive sulphur for the risk mitigation of power transformers
- After treatment power transformers have extended life
- INT process can be used for PCB contaminated waste oil and equipment treatment for final disposal