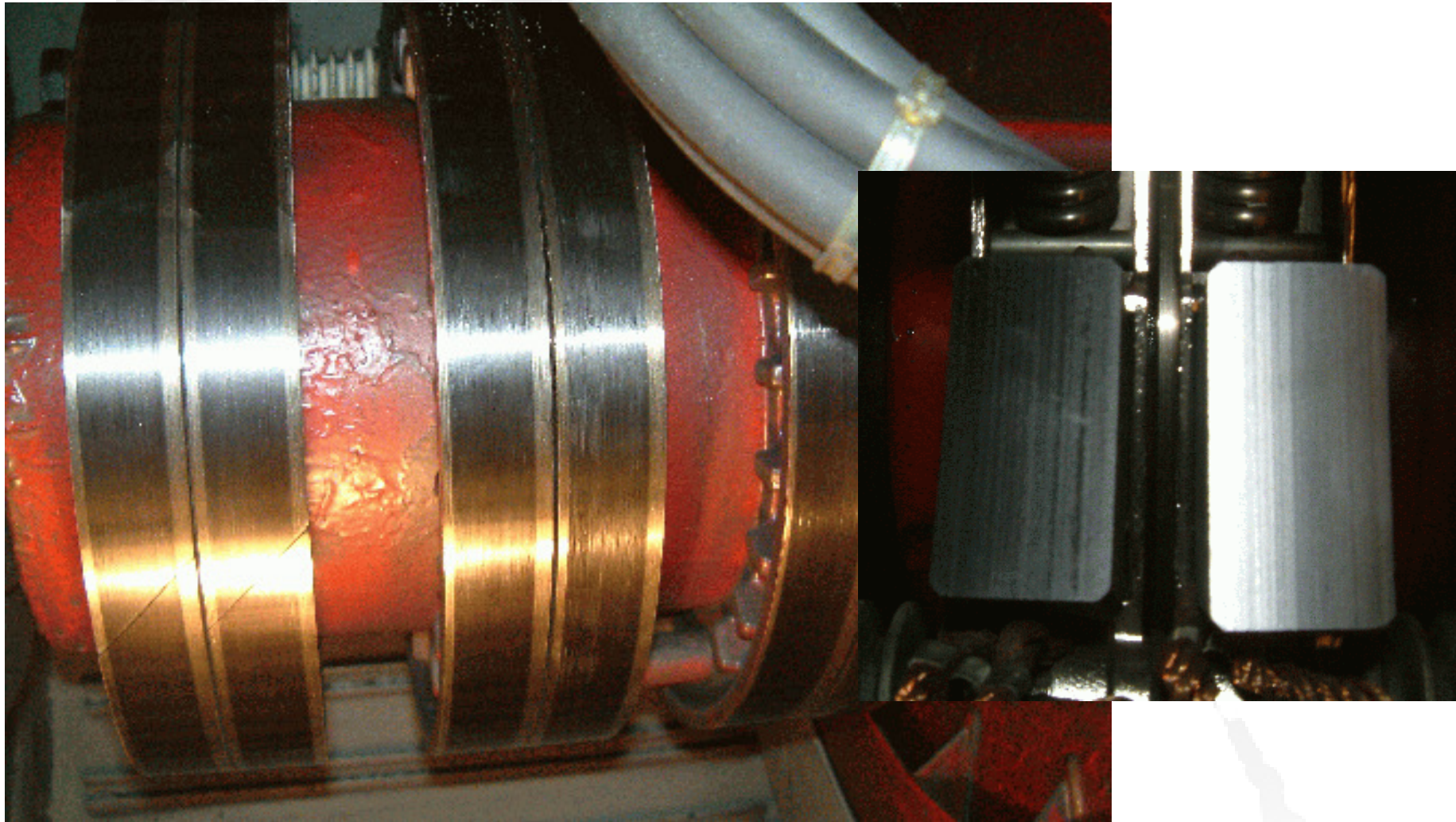




Case studies – slip ring machines

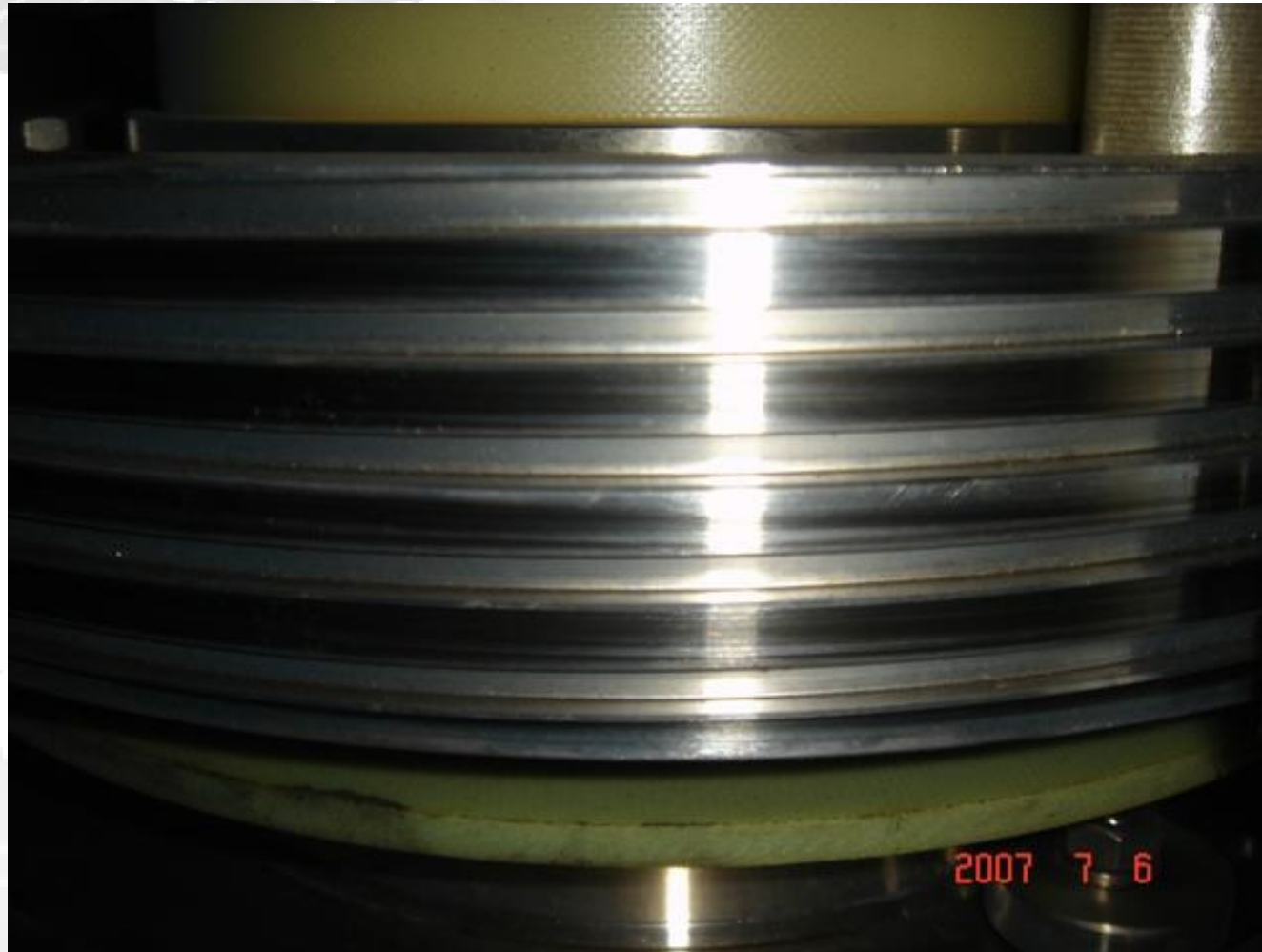
Good performance

Schunk Kohlenstofftechnik

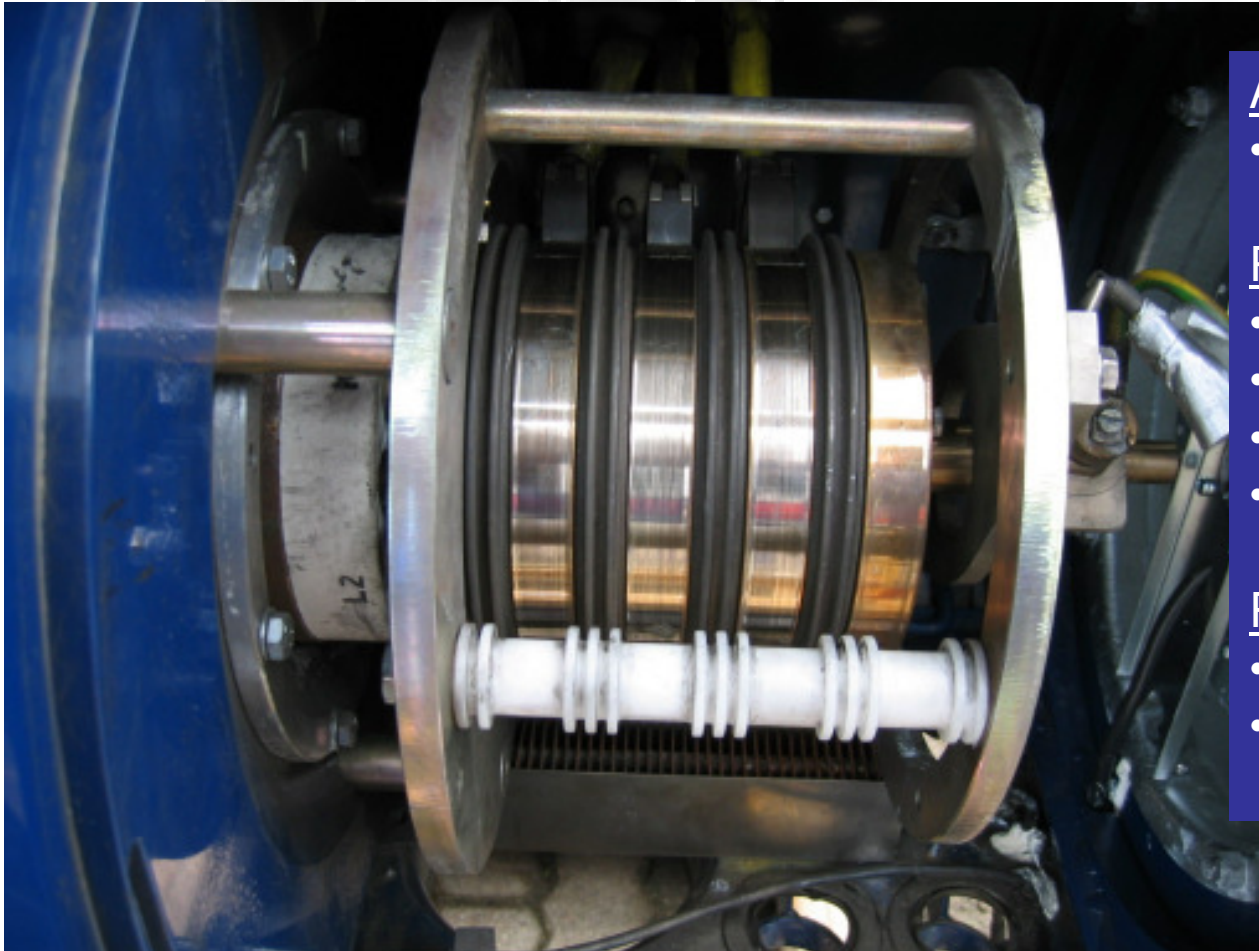


Good performance

Schunk Kohlenstofftechnik



Too smooth surface



Appearance

- smooth, shiny surface

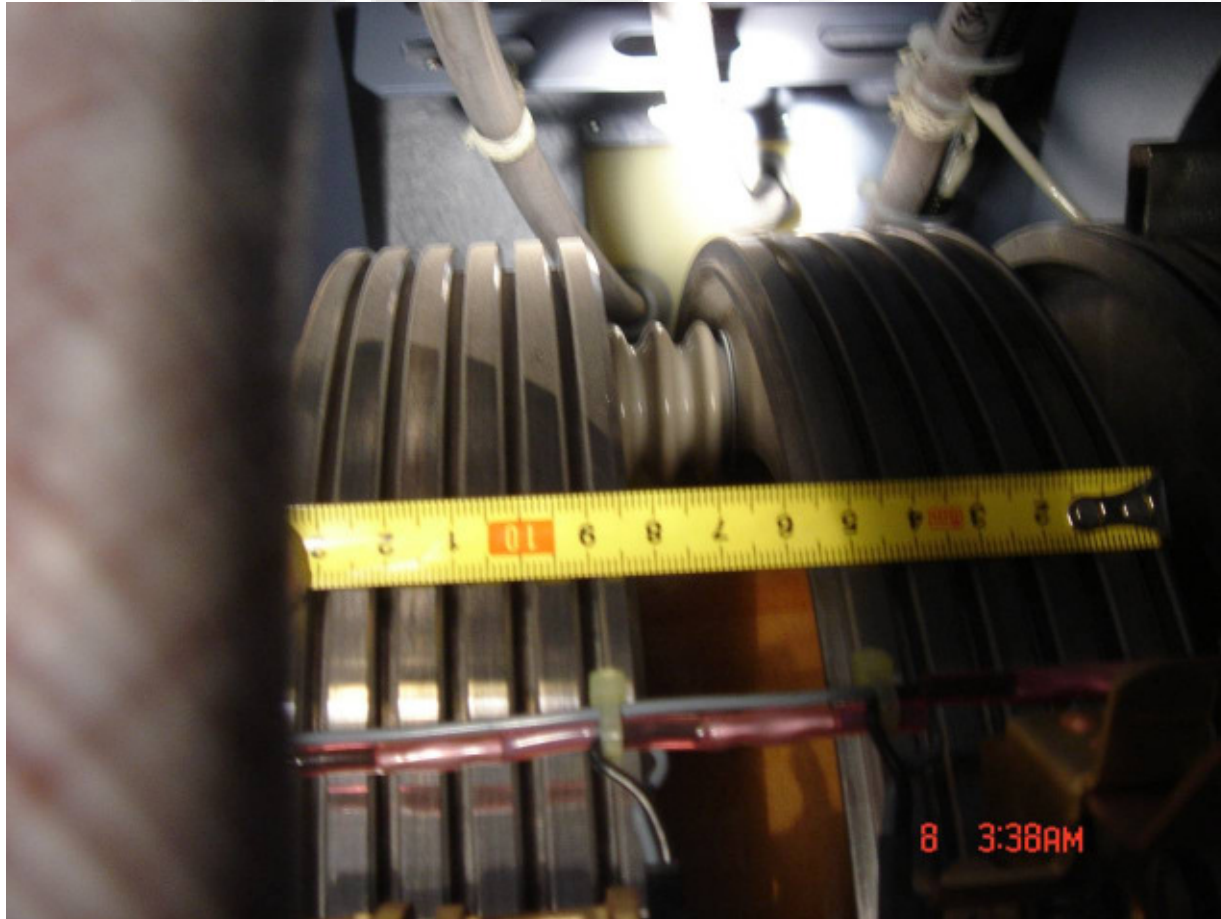
Problem

- No film formation
- High friction of carbon brushes
- Brush vibrations
- Ring wear-out

Remedial action

- Grinding of ring surface
- optimal surface roughness
Rz 5-8 μ m (Ra 0.8-1.2 μ m)

Too smooth surface





Appearance

- Palpable grooves in the brush contact surface and on the ring surface
- film disappeared

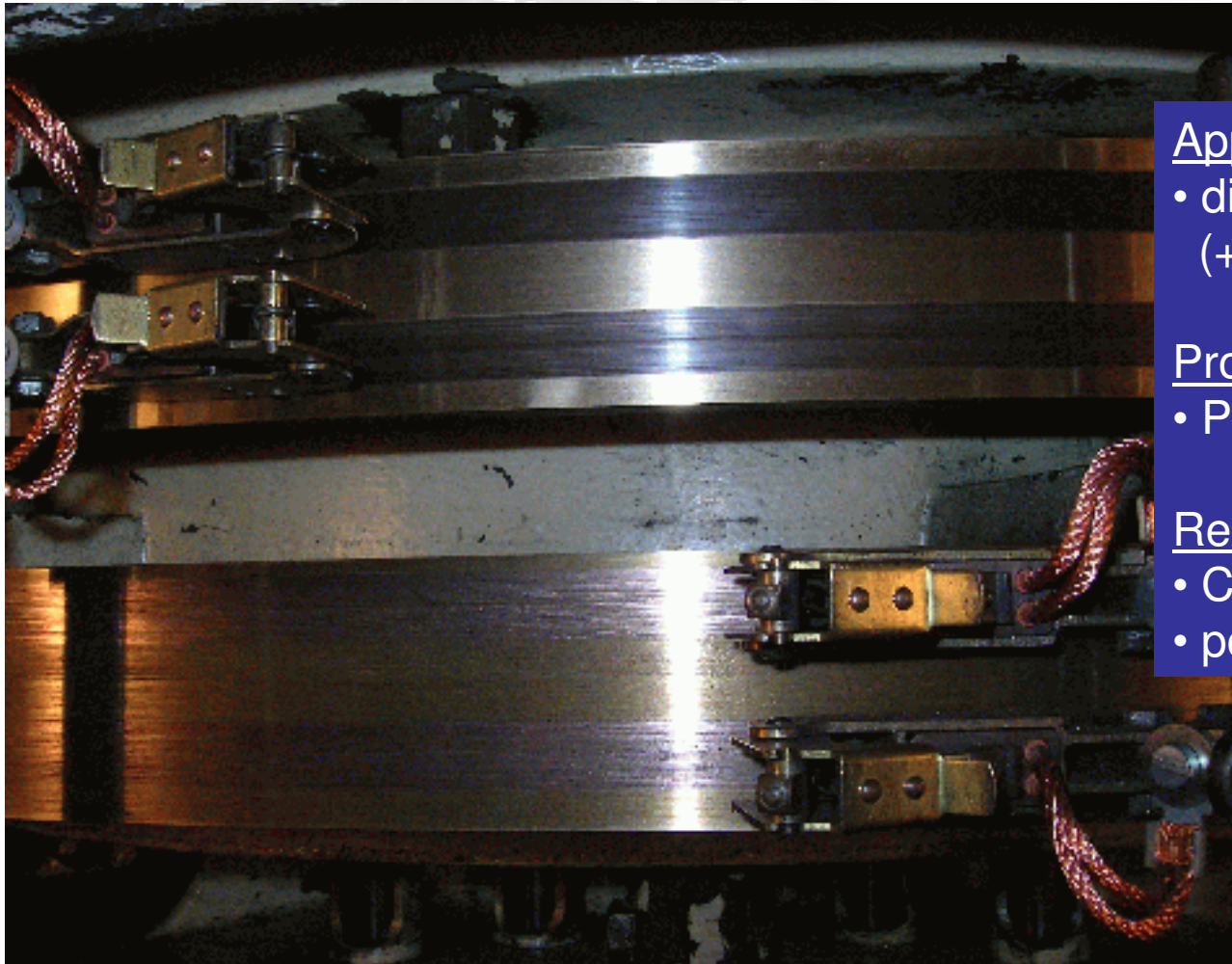
Problem

- abrasive dust and / or
- too low ring temperature
- too low electrical load

Remedial action

- Check ring temperature (opt. 60-90 °C)
- Check load condition
- Filtering

Different film formation



Appearance

- different film formation on (+) and (-) ring

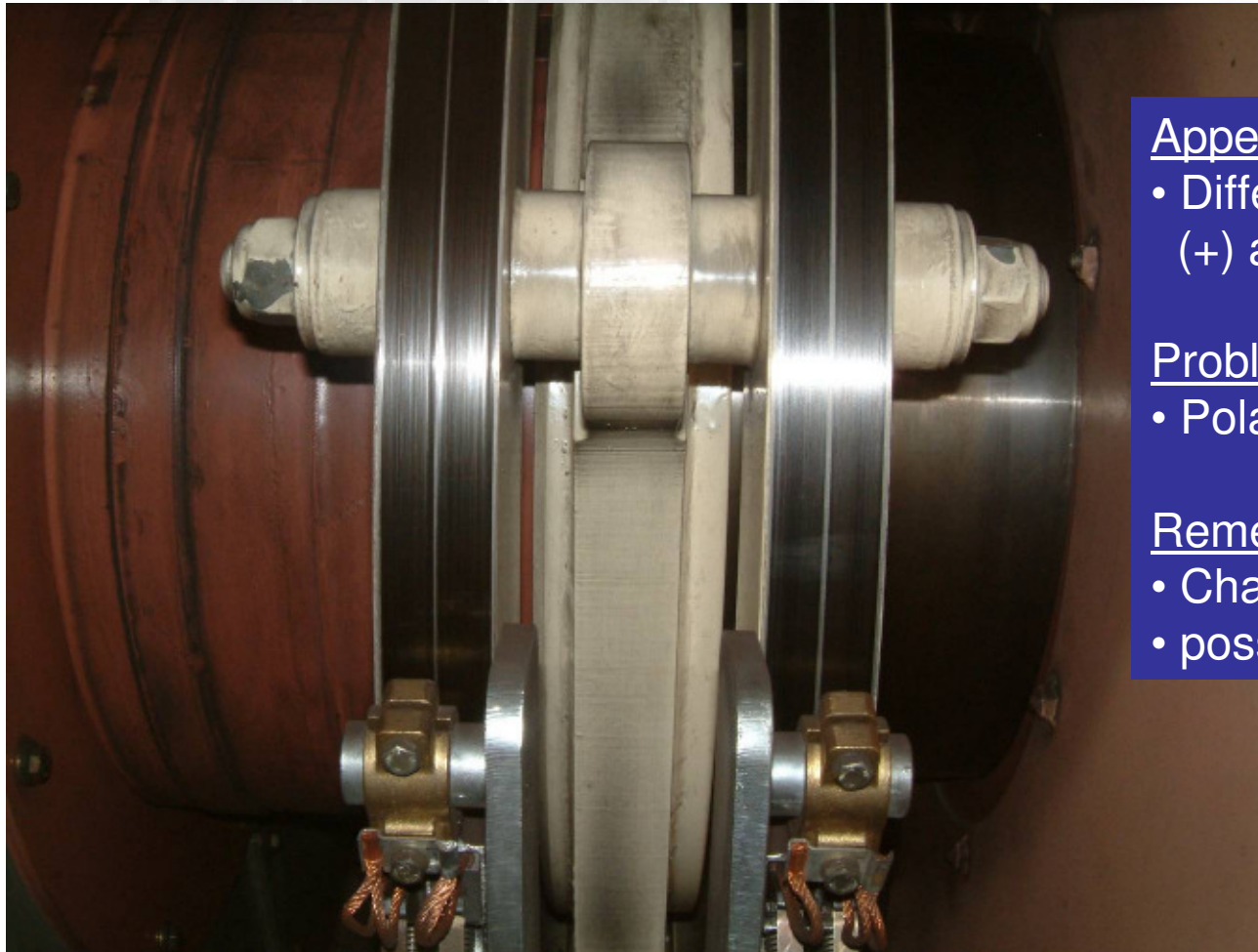
Problem

- Polarity effect

Remedial action

- Change of polarity
- possibly different brush grades

Ring attack by means of polarity effect



Appearance

- Different ring wear-out on (+) and (-) Ring

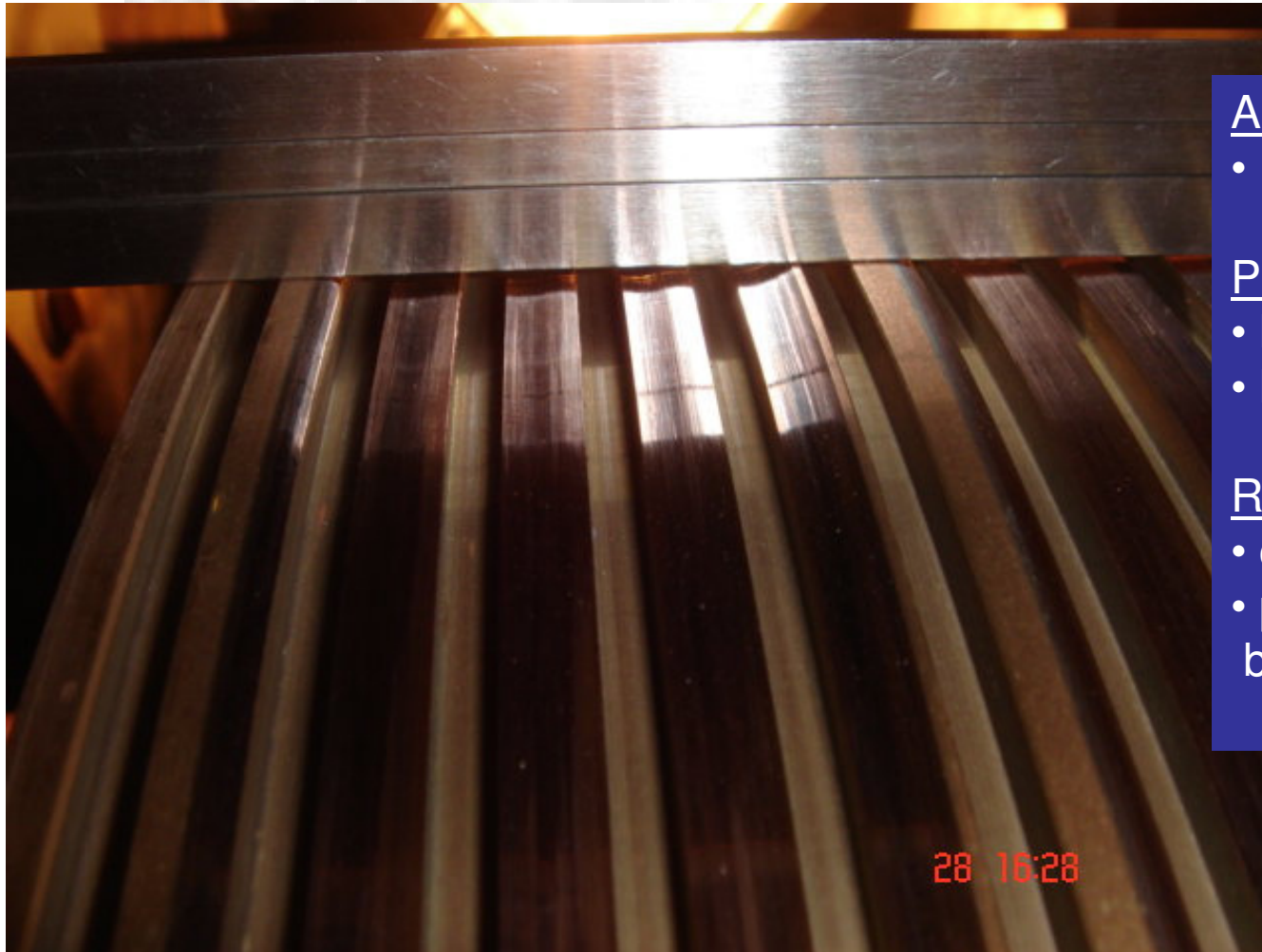
Problem

- Polarity effect

Remedial action

- Change of polarity
- possibly different brush grades

Ring attack



Appearance

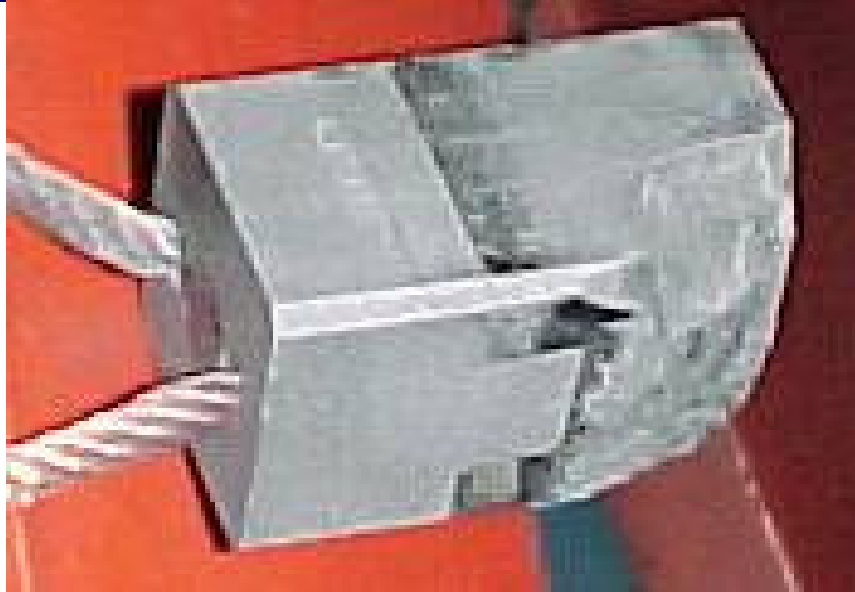
- Ring wear-out on all rings

Problem

- low load
- low temperature ($< 40^{\circ}\text{C}$)

Remedial action

- check current density
- possibly reduce number of brushes



Erscheinungsbild

- Damage of brush edges
- Broken brushes

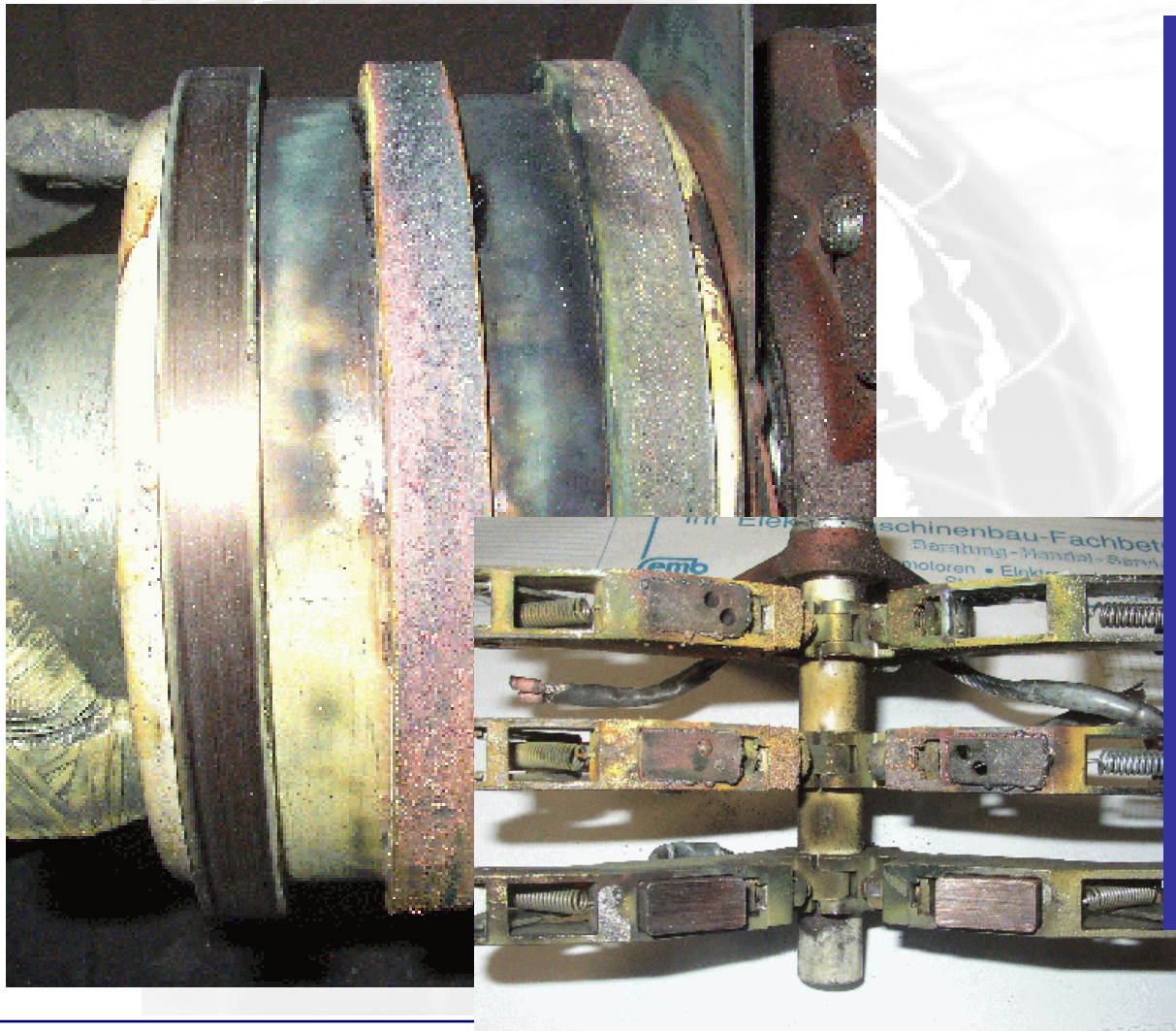
Problem

- high friction by means of smooth ring surface and / or high temperature

Remedial action

- Check of surface roughness
- Roughening of the surface
- Change of cooling





Appearance

- Destroyed brush holders and rings

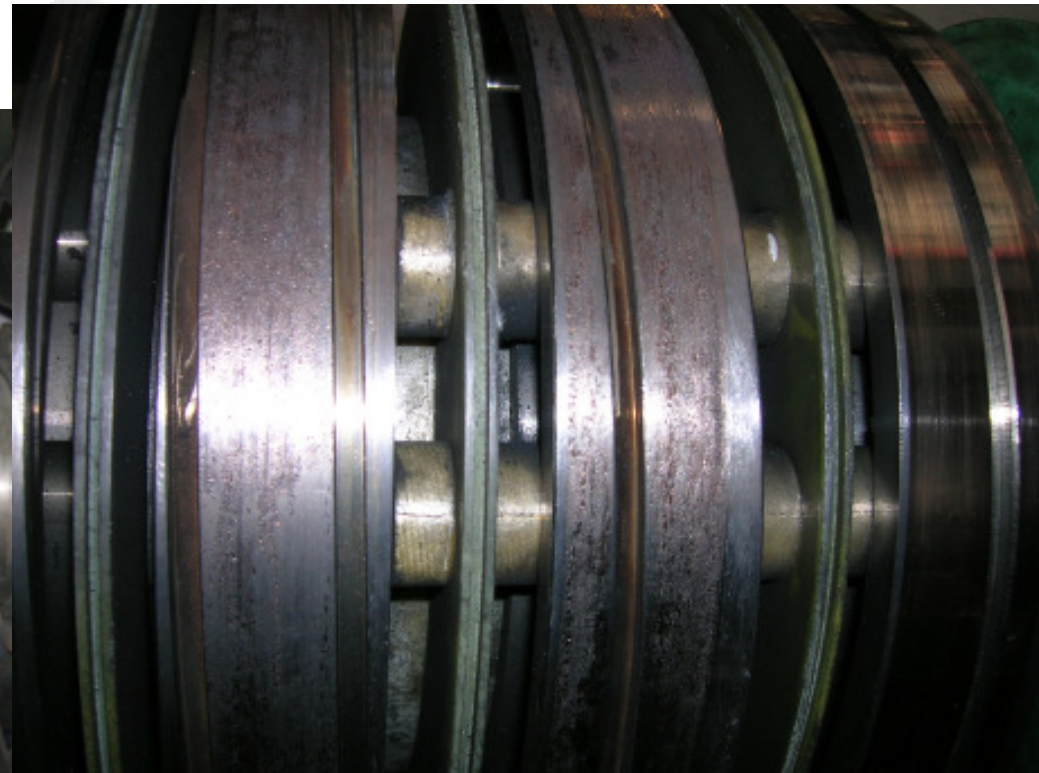
Problem

- Flash over by means of
 - Vibration
 - Voltage peak
 - dirt

Remedial action

- Regular cleaning
- Check of out-of-roundness
- Check of basement
- Sufficient ventilation for removal of brush dust

Flash over





Appearance

- Stuck brushes

Problem

- Swelling of the brush at high humidity and high electrical load

Remedial action

- Use optimised brush grades



Appearance

- Markings in brush size on the ring surface

Problem

- Stand still corrosion by means of
 - Residual current
 - Flow of ions

Remedial action

- Take off the brushes in case of long stand still periods
- Paper underneath the contact surface