

Hardening of piston ring grooves

Initial situation:

- piston rings seal the combustion chamber of combustion engines on the crankshaft side against the engine block
- A tribological system, which is characterised by extreme temperatures and mechanical stresses, is located between piston ring and cylinder running surface.
- Decreased life time of piston tops



Piston top made of 42CrMo4 (Da=320mm)

Solution: Hardening of piston ring edges

Advantages of hardening:

- Congenuous material in hardened layer and basic material
- No reworking on piston necessary



Electron beam hardened groove edge (hardness layer depth (ht) up to approx. 2mm)

Why Electron Beam:

- Economical substitute for induction and laser beam hardening
- high flexibility e.g. regarding geometry and process parameters
- partial hardening of stressed areas

