



Basic principles of
SMALL PUNCH TEST method
(SPT)



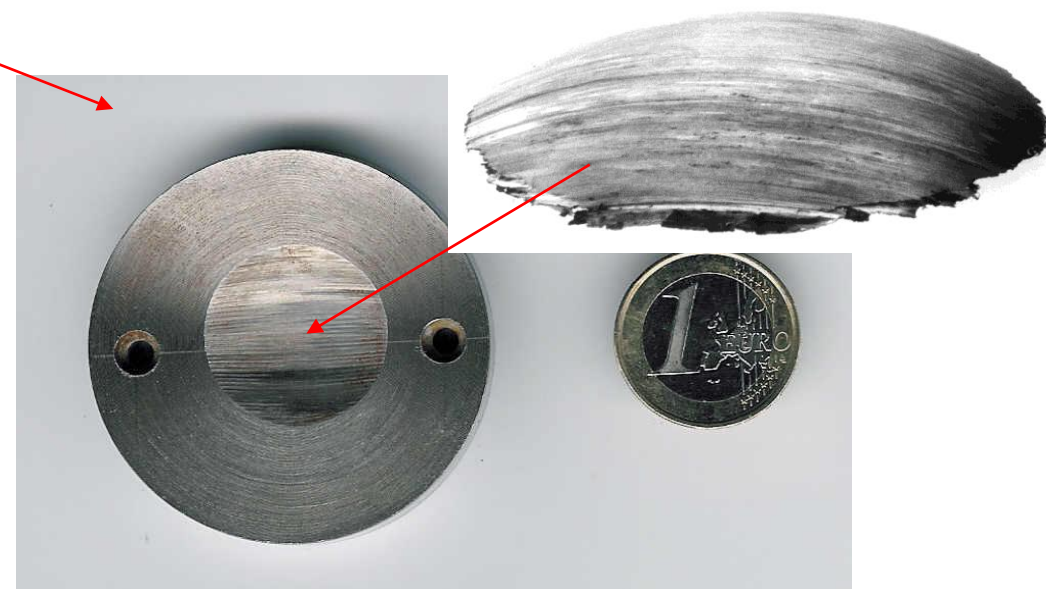
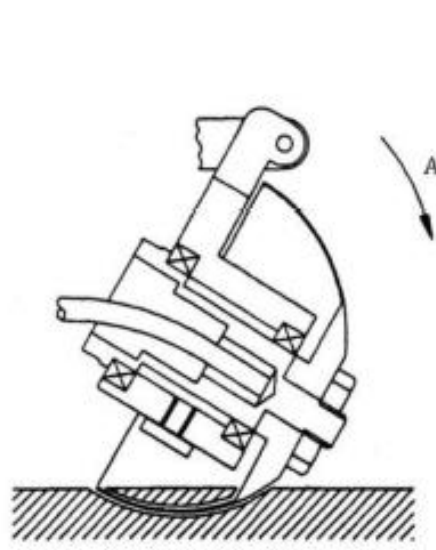
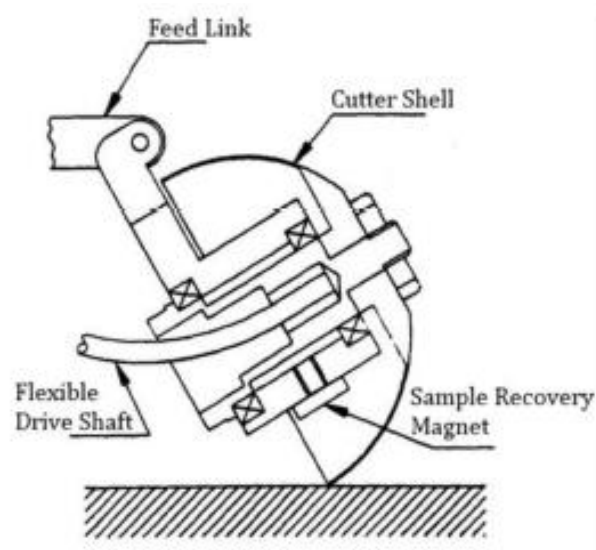
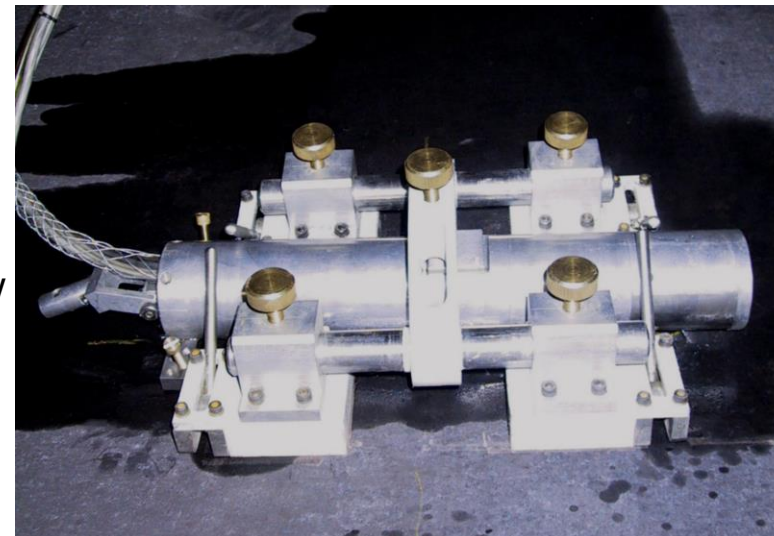


WHAT IS SPT ?

- Nearly non-destructive (without need of repairs after sampling) sampling and testing method for analysis of metallic materials
- Developed from 80's of 20th century, embedded in test standards (ASTM E3205, EN 10371)
- With SPT we are able to evaluate:
 - Chemical composition
 - Mechanical properties (yield strength $R_{p0.2}$, tensile strength R_m , hardness)
 - FATT transition temperature (ductile-brittle fracture)
 - microstructure
 - Brittle fracture properties (toughness)
 - Creep characteristics
- Evaluation is based on correlations of SPT results with results of conventional mechanical tests

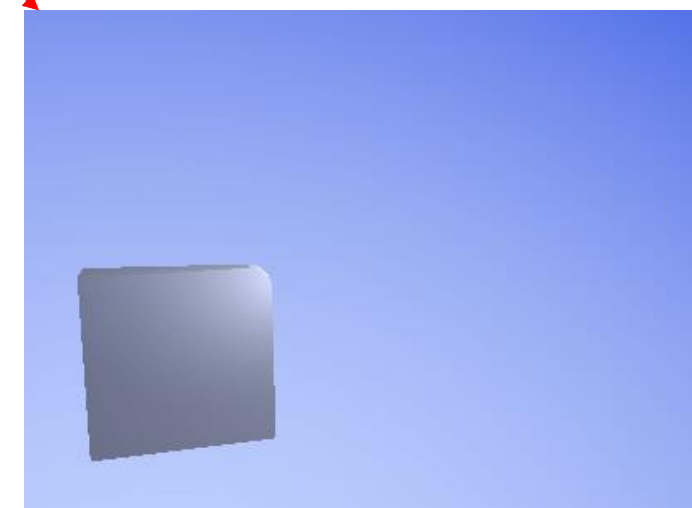
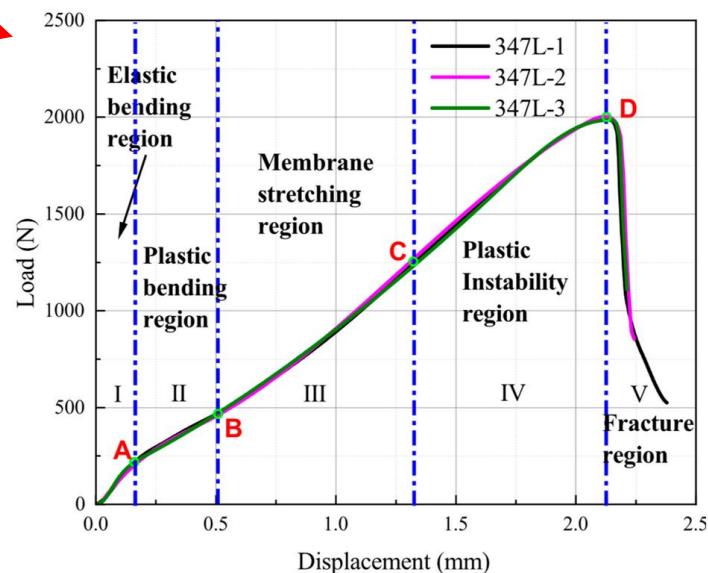
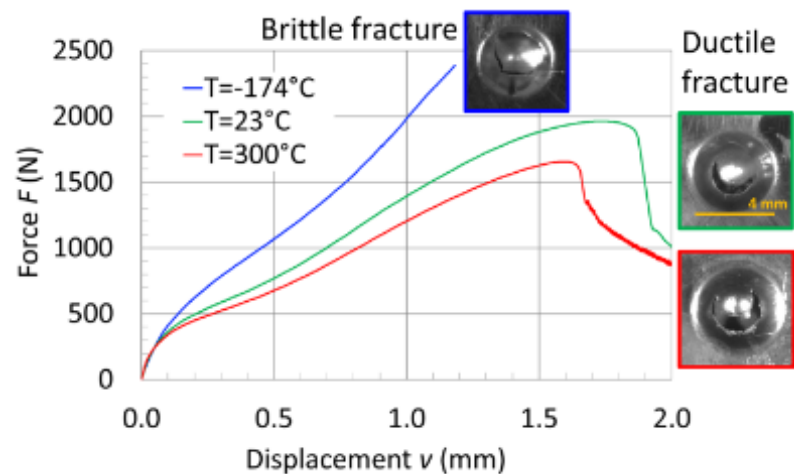
SAMPLING PRINCIPLE

- Special sampling device SSam™-2 by Rolls-Royce →
- High surface speed of the grinding tool combined with its slow rate of travel guarantee no heat affection of the sample
- Material is sampled in the form of spherical cap with maximum diameter of 30 mm and thickness of 2,5-3 mm. Sampling process takes between 2-4 hours



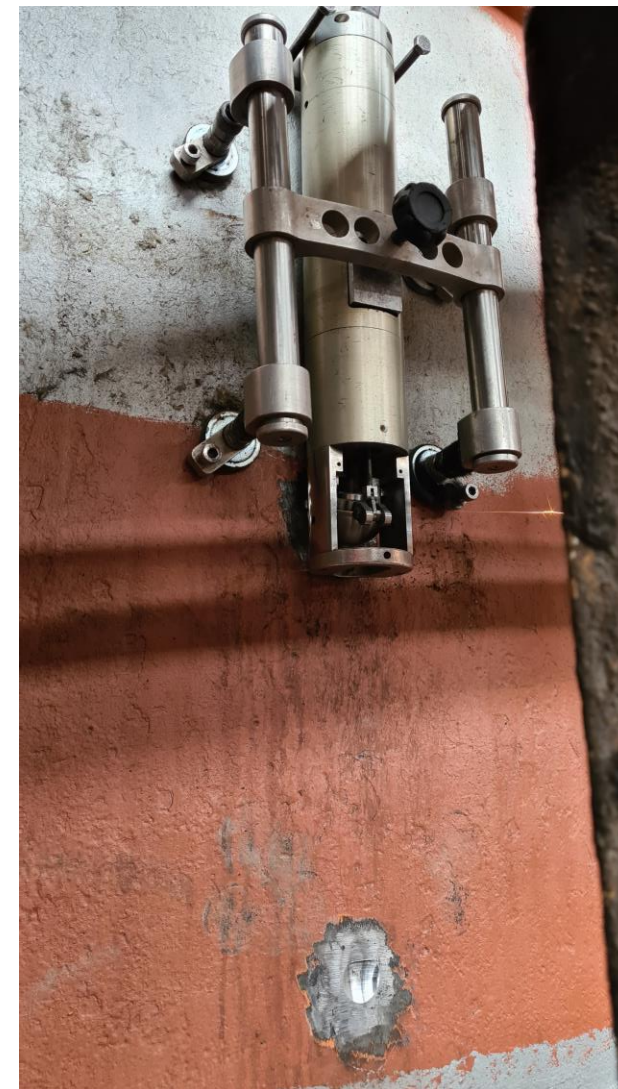
PRINCIPLE OF THE TEST METHOD

- Test samples are miniature discs with diameter of 8 mm and thickness of 0,5 mm manufactured from sampled spherical cap.
- Samples are pushed through by small hemispherical punch - result is the force x displacement of the punch (or deflection of the sample) curve.
- All additional material characteristic are derived from the force x displacement curve.



WHAT ARE WE OFFERING

- Residual lifetime assessment (coal power plant components, heavy mining machinery, etc.)
- Actual material properties assessment after operation faults, or before/after repairs, etc.
- Complex analysis of material (including sampling) tailored to customers needs





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