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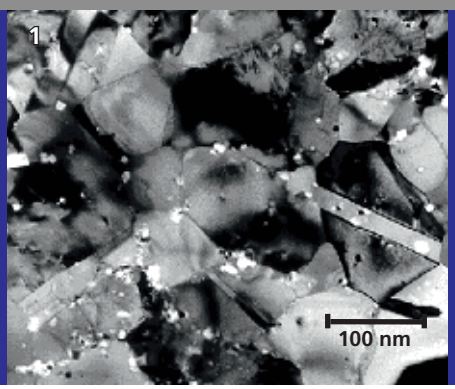
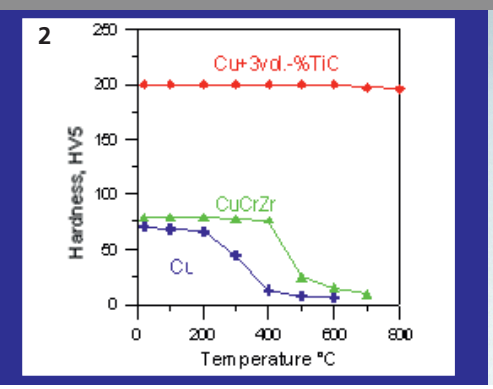
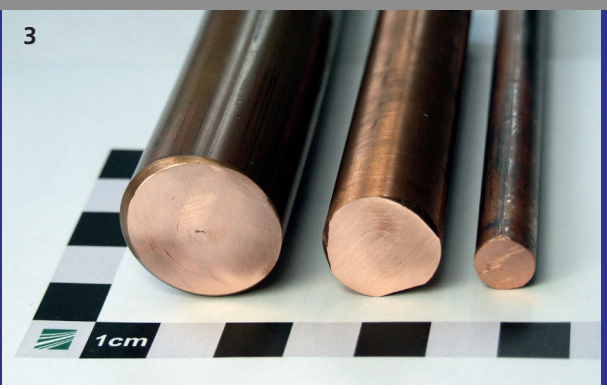
FRAUNHOFER INSTITUTE FOR MANUFACTURING TECHNOLOGY
AND ADVANCED MATERIALS IFAM, BRANCH LAB DRESDEN







1 *Electron Energy Loss Spectroscopy (EELS), recorded at the TEM (dE=50eV, $Ti_{M2,3}$ edge), of a DS-Cu alloy (white particles: TiC dispersoide)*

2 *Hardness after tempering (1 h heat treatment time) of a dispersion-strengthened Cu alloy in comparison to conventional Cu materials*

3 *Hot extruded DS-Cu samples*

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DISPERSION-STRENGTHENED MATERIALS

Goal

- Improvement of high-temperature strength and creep resistance of metallic materials by incorporation of nanometer sized (d < 20 nm), thermodynamically stable particles (dispersoids) into the metallic matrix
- Low dispersoid volume fraction (typically < 5 Vol.-%); therefore, intrinsic properties of the metallic matrix are insignificantly affected (e.g. electrical and thermal conductivity)

Technology

- Powder-metallurgical technologies for powder processing
- Manufacture of semi-finished products is carried out by pressure-assisted consolidation methods (e.g. extrusion)

Material examples

- DS-Cu alloys, e.g. for applications in welding technology
- DS-Ni alloys, e.g. for automobile and aircraft components exposed to high temperature and corrosion
- DS-Fe alloys, e.g. for components in power engineering (nuclear technology, nuclear fusion) exposed to high temperature

Services

- Development of dispersion-strengthened materials with different metallic matrices and reinforcement particles
- Technology development
- Material characterisation
- Consulting and research on the application of dispersion-strengthened materials