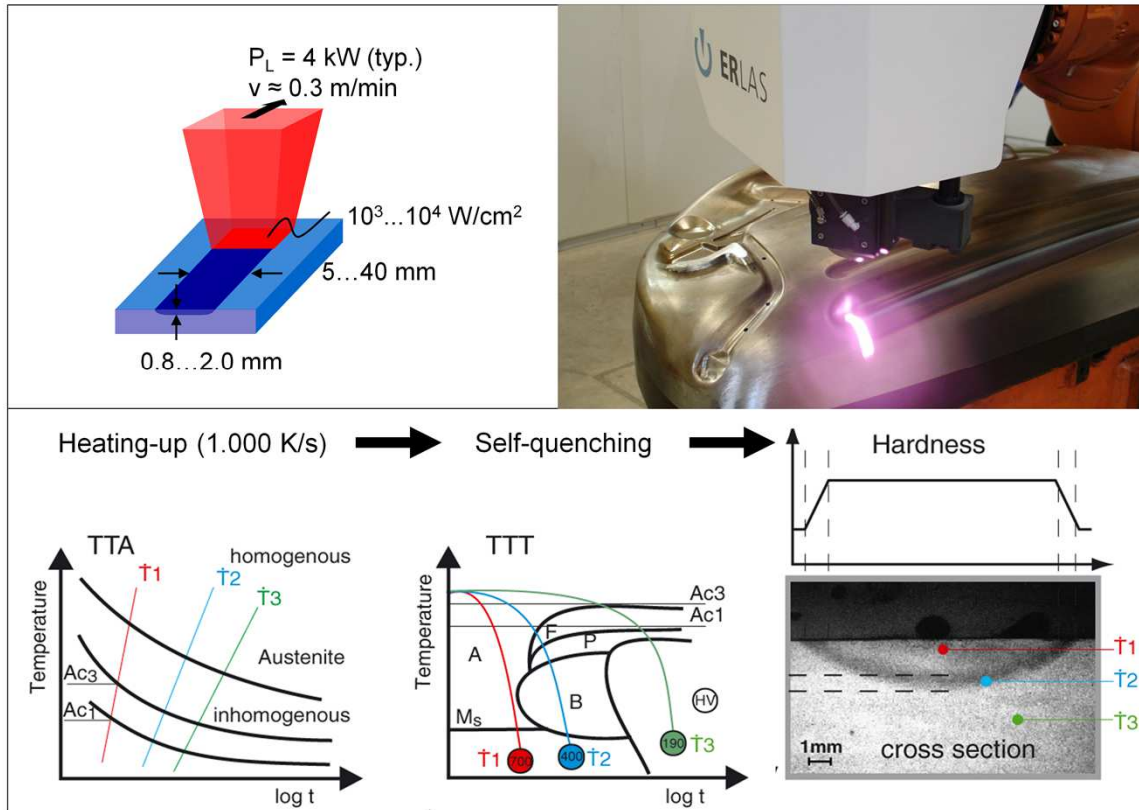


Procedural Principle Laser Beam Hardening



Laser hardening is a transformation hardening process, where a perlitic steel is heat up very fast with about 1.000 K/s to a temperature where the atomic structure converts to a fine austenite. The carbon diffuses from the borders of the grains into the austenitic structure. When the laser beam is moving forward the material is cooling down quickly by self-quenching and the atomic structure transforms again. The carbon inside the atomic structure blocks the formation of a perlitic structure and the hard martensite is formed.