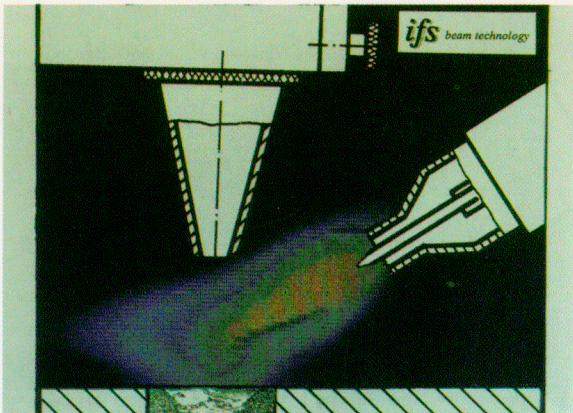


PLASMA AND LASER ENHANCED ARC WELDING FOR AUTOMATIC APPLICATIONS



Principle of the LASER-TIG process (enhancement of the TIG arc by a low power laser beam)

CONTRACT : BREU-0069
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OBJECTIVES

The overall objective of this focussed fundamental research project is to improve the TIG welding process by laser enhancement and the Plasma welding process. The deep understanding of the mechanisms governing the arc welding process will lead to optimizations resulting in better performance and reliability. The industrial application in the fields of automated laser-TIG and plasma welding will significantly increase productivity.

MAIN TASKS

The major research areas are the :

- investigation of the underlying physical mechanisms of the welding arc (distribution of the physical variables in the arc, energy transfer between arc and weldpool, the role of external parameters) by arc spectroscopy, plasma diagnostics and mathematical modelling;
- determination of the operating parameters for positional plasma keyhole welding;
- enhancement of the TIG arc by a low power laser beam : influence on stability, weld quality, process performance and ignition behaviour;
- design and construction of the first combined laser-arc welding facility for the enhancement of the TIG process using a minimum of laser power;
assessment of the processes for automated applications.