R&D Project Laser beam welding of field joints
The idea

Field joints need three independent steps:

- Welding
- Testing of welding
- Coating of joints

Laser beam welding is a process with a low heat generation, which allows to combine these three steps to an individual working operation.
Objectives

The concept:

Equipment for welding and testing based on a fiber laser which allows to fix the laser optic and ultrasonic probe in a rotating frame for orbital welding.

Topics

- Reducing time for construction
- reducing logistical effort
- 100% testing of welding line
- automatic documentation
The Prototype

Four steps for Field welding:

1. Video check of pipe ends
2. Welding
3. Video check of welding line
4. US Testing

First prototype
First Application - Welding

Gas pipeline 25 bar
Greifswald, Ontras, October 2015

DN 300, 6,3 mm

Length of testing line 1000 m

200% testing by TÜV Süd
(X-Ray + Ultrasonic)

incl. procedure testing

Result:

No findings,
Pipeline in service

Report on TV 2015
Development of US-Testing based on EMAT-technology is finished in 2019

Certification body has accepted this testing process for wall thickness between 4 and 8 mm pipe according to CEN/TR 14748

A prototype for site testing is available in dimensions from DN 200 to DN 400

EMAT testing of laser welded Pipe *without* irregularities

EMAT testing of laser welded Pipe *with* irregularities
In Germany the regulations since 2015 allows laser beam welding as an option.

Without this option no supply would allow the testing of such an equipment in the field.

The first Applications will be individual coached and checked by developing team and approval body.

There is a need for experience to fix the requirements for the application in regulations.

At time a Prototype for smaller Pipelines is available. Here also first experience for developing a market ready product is needed.

Thank you for Attention!

What are the possibilities and conditions for introduction of such a product in the US-market?