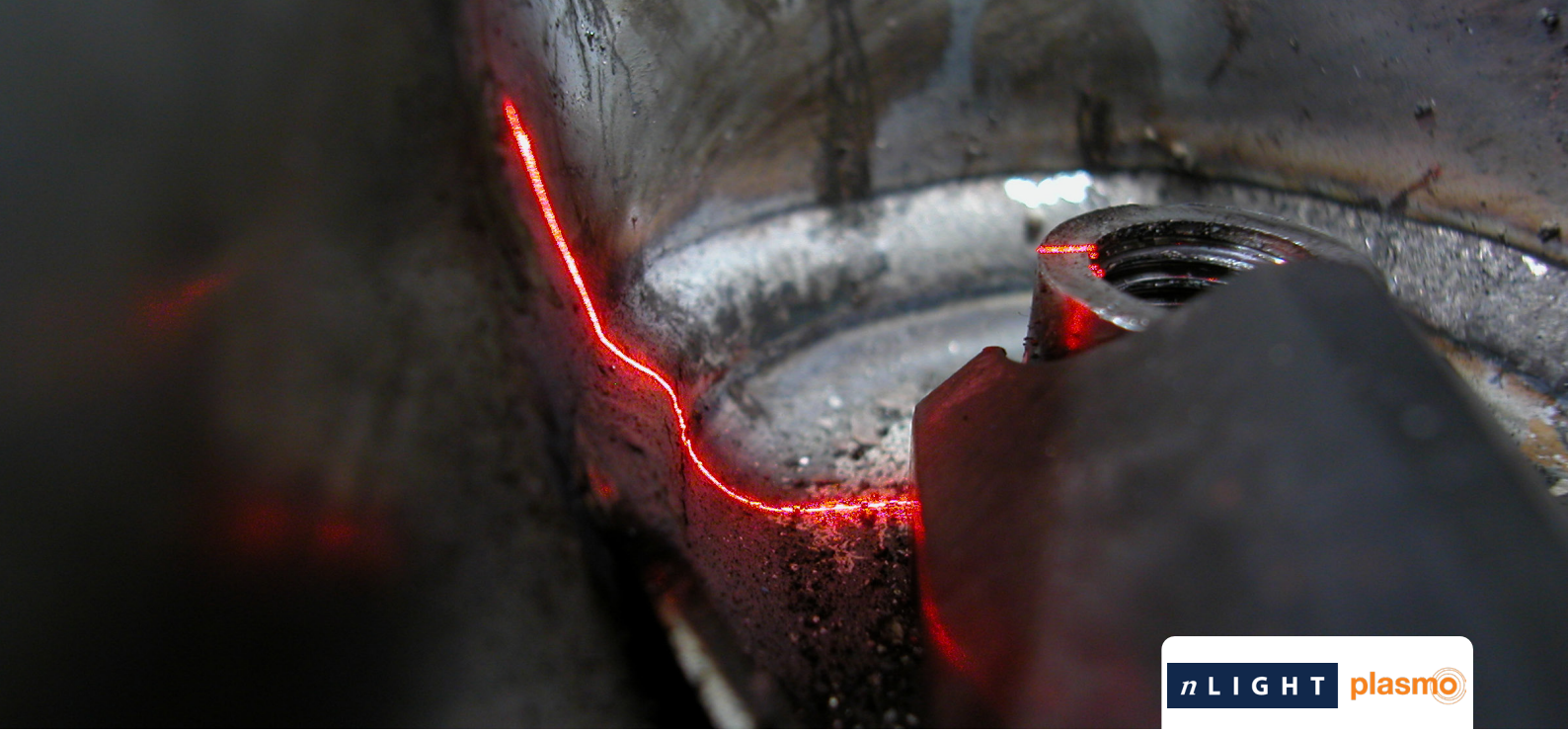


QUALITY CONTROL FOR TUBES AND PROFILES

At a glance

Quality control for standard and endless pipes, tailored tubes and profiles requires individual solutions to avoid expensive production loss, extended downtime and safety risks.

Challenge

Continuously increasing requirements for quality and economic efficiency challenge customers to optimize products and production processes on an ongoing basis. In view of high productivity and the precision as a tool, these extremely fast processes are becoming constantly more significant in modern manufacturing technology.

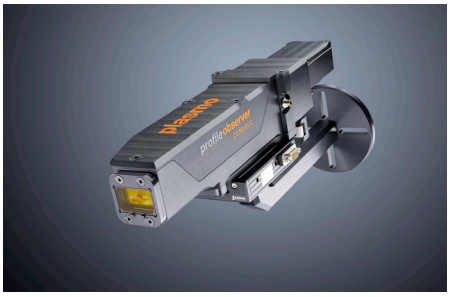
Our customers, specifically in the automotive sector, are among the major innovation drivers and an important sales market for pipes and profile manufacturers. Every vehicle includes many meters of (endless) pipe or pipe-like profiles (tailored tubes). Also, the governmental mandates for the reduction of CO2 emissions have resulted in significant additional challenges for manufacturers and suppliers.

APPLICATION welding of tubes and coils
JOINING PROCESS MIG MAG welding
POSITION inline or post weld
PLASMO SOLUTION plasmo profile**observer**
TECHNOLOGY camera based

plasmo´s solution

During the welding of pipes and endless profiles, the ease of welding must be considered. Many issues are relevant, from the design of complex profiles and suitable materials while developing a dependable and efficient manufacturing process. Practical quality control is particularly important in this context. In many pipe/profile systems, the weld is no longer visible and any control must be performed in-line. Also, it is crucial that any defects are identified immediately so that the cause can be remedied as quickly as possible. As a result, rejects can be reduced significantly.

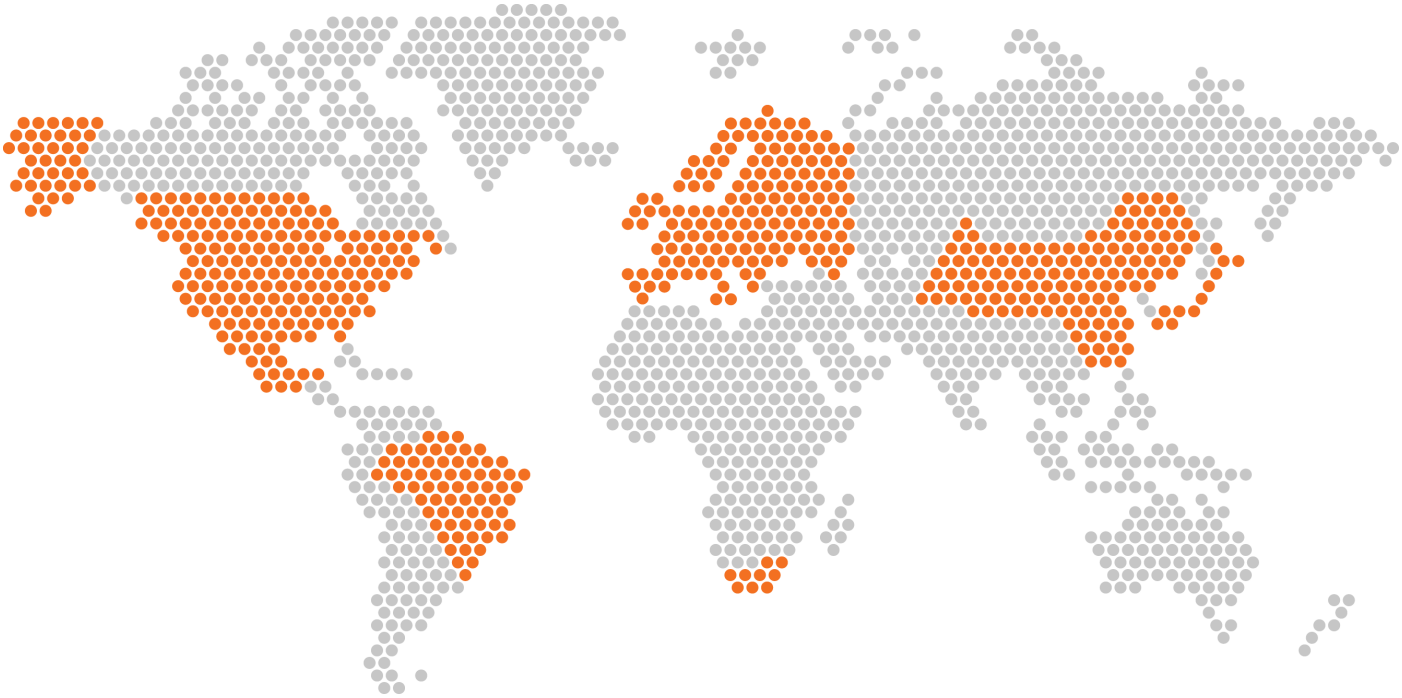
1. **Process visualization:** Identifying the potential for production increase and statistical analysis of the processes. In addition, improvement of the process understanding by system operators as well as detection of systematic errors.
2. **Fault detection through OK/NOK decision:** This involves the definition of faults, the elimination of defective parts directly during or after the process. The goal is a 100 percent fatigue-free and objective control of the entire weld.
3. **Accurate meter-by-meter traceability:** Continuous control of interrelations of multiple productions steps ensures subsequent analysis and definition of critical sections.



Sensor and camera based test procedures as well as ultrasound analysis offer solutions for a wide range of technological challenges for processing speeds of up to 80 -120 m/min from the visualization of the processes and fault detection through to the traceability of components and production steps. Modern online systems are used to ensure early detection of cracks, damage, edge offset, pores or pressure of rollers, etc., that might be produced during the welding process.

Result - quality control

Cracks and damage produced in the welding process are detected early by an online monitoring system and are identified by a time-delayed marking system on the profile or pipe in endless processes. Particularly in the case of stainless steel pipes, these online systems could under certain circumstances reduce the extent of eddy current or radiographic tests, which in some cases are required by law, as rework can be completed beforehand. An online monitoring system detects cracks and damage from the welding process at an early stage and is characterized by a time-delayed marking system on the profile or pipe during continuous processes. Due to these online systems, the partly legally prescribed tests with eddy current or x-ray can be reduced, especially for stainless steel tubes, since a post-processing can take place first.



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