

## Intelligent System of the Grinding Robot for Spiral Welded Pipe

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**Abstract :** The spiral welded pipe manufacturing industry requires strict production standards for automated grinders for welding seams. However, traditional grinding machines in this sector are insufficient due to a lack of quality control protocols and inconsistent performance. This research aims to improve the quality of spiral welded pipes by developing intelligent automated abrasive belt grinding equipment. The system has equipped with six degrees of freedom (6 DOF) KUKA KR360 industrial robots, enabling concurrent grinding operations on both internal and external welds. The grinding robot control system is designed with a PLC, and a human-machine interface (HMI) system is employed for operations. The system includes an electric speed controller, data connection card, DC driver, analog amplifier, and HMI for input data. This control system enables the grinding of spiral welded pipe. It ensures consistent production quality and cost-effectiveness by reducing the product life cycle and minimizing risks in the working environment.

**Keywords :** Intelligent Systems, Spiral Welded Pipe, Grinding, Industrial Robot, End-Effector, PLC Controller System, 3D Laser Sensor, HMI.

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