High speed visualization of flux coated electrode hand welding

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Description of process:

The image shows an electrode hand welding process observed from the side. The electrode is a flux coated electrode type Prima Blue by company Kjellberg Finsterwalde Elektroden und Zusatzwerkstoffe GmbH. The core wire diameter is 3.25 mm. The current was 120 A and a negative poled electrode was used.

The power supply was a inverter welding unit of type PICO 300 CEL by the company EWM Hightech Welding GmbH.

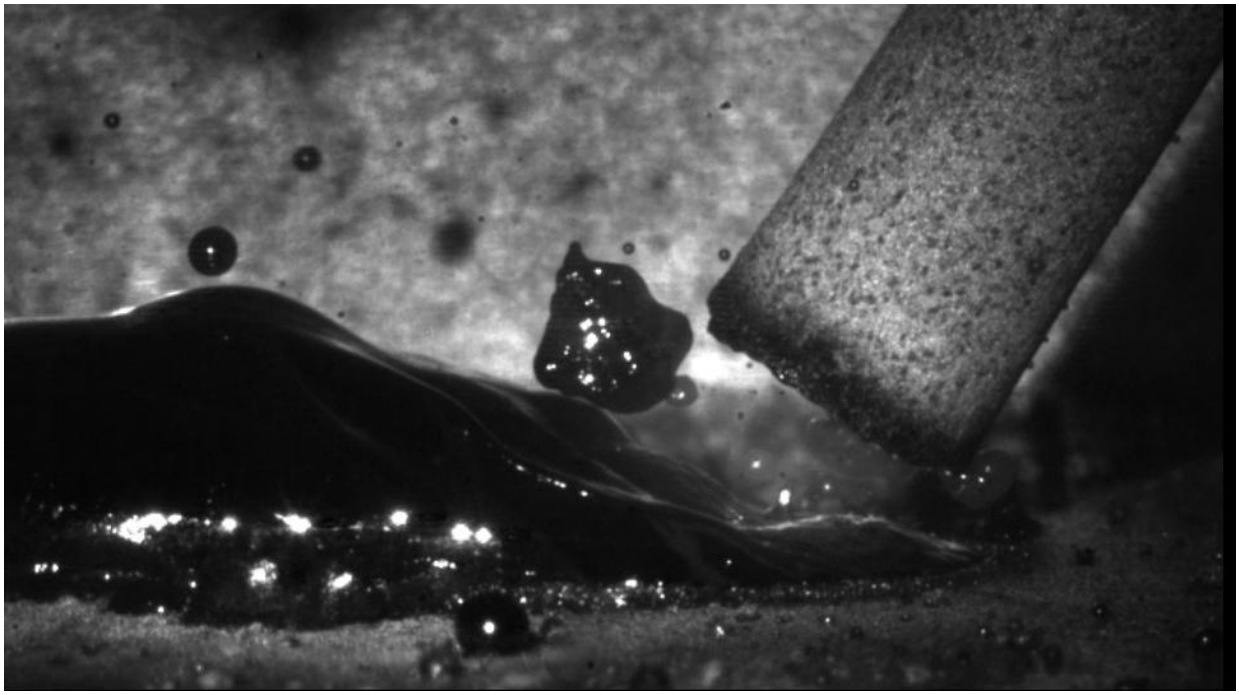
The base metal was a nonalloy construction steel of type S235JF. The weld was a bead on plate weld.

The video was taken at a frame rate of 7000 fps with a resolution of 700 x 400 pixel and a shutter time of 1/440.000 s. For a homogeneous illumination a vertical steel plate has been added to the background.

The goal of the measurement was the investigation of the burning behavior of the electrode depending of the welding parameters. The burning behavior of that electrode was used as a reference to study the behavior of other commercially available electrodes but also to study the behavior of electrodes from own development projects.

In order to eliminate the influence of a welder to the result the tests were performed at an automated welding machine. The machine controlled the wire feeding speed based on the power and current signals.

The results of the measurement were used for the improvement or development of new hand welding electrodes.



Imaging technology

Camera: Photron Fastcam SA5 Model 775 K –M1 with 8 Gb memory
Objective: Sigma 180/3.5 EX DG Makro IF APO Nikon
Illumination: Cavitar Cavilux HF

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