CONSISTENTLY HIGH QUALITY IN LASER WELDING

A company specializes in welding a wide variety of metal components using different welding processes. For quality control purposes, the company would like to assess the behavior of the molten metal during laser welding and, to this end, record the process with a camera and then analyze and document the results.

In connection with this task, the following problems arose for the company: During the welding process, the light emitted by the plasma causes a fade in one shot. Due to the overexposure, a large part of the image information is lost for the camera. In addition, the desired system must be able to capture the fast-moving process of laser welding in order to evaluate the result of the welding work in its details. In addition, there is not much installation space available for a camera system including lighting in the area where laser welding takes place. Therefore, the solution should be as compact as possible.

While searching for a suitable device, the company finally became aware of the extremely compact **OC29** high-speed cameras from ipf electronic. With these systems, fast-running industrial processes with very high frame rates can be easily recorded and analyzed. In combination with free software, possible causes for failures or errors, but also potentials for process optimization can thus be identified quickly, economically and in an uncomplicated manner.

As already explained, the light from the plasma causes fading during welding. For this reason, a combination of lens filters was used in this application for the **OC299725** camera (monochrome), which only allows the desired light to pass through for image acquisition. In order to still get enough light for a usable image capture, an additional illumination is used.

Based on previous experience with the systems, it has also proven useful not to install the illumination in the same direction as the camera, but to position it at an angle of approximately 90° to the detection area and also as close as possible but still at a non-critical distance.

Thanks to the high-speed camera from ipf electronic, the company can now precisely record the process during laser welding and, by analyzing the recordings, identify possible problems as well as potential for optimization. The recordings are also archived for complete documentation of the welding quality.