

Process Control On UV Lamp



For fast UV lamp drying processes in CD & DVD production and drying of dyestuffs and colors in the printing industry, it is important that the light source has the right intensity at the correct wavelength. Otherwise either the process takes too long or the material is not completely consolidated. Since these light sources change the emitted radiation during their lifetime, constant inspection is necessary.

The given task

The lamps need to be inspected for intensity and wavelength distribution. As soon as they are altered, the intensity needs to be increased. If this does not help, the lamp needs to be replaced. A device for permanent inspection of each lamp is necessary. The process may not be prolonged by the inspection or by replacing the UV lamps too early.

The solution

An OEM version of our TRISTAN UV spectrometer is used to control the spectral distribution and intensity of the UV light. It is fully integrated into the process control system of the production line. Due to the unique design of the integrated processing unit (a 32 bit RISC processor), a separate PC for data transfer is not required. The lamp is operated for the actual lifetime at the needed parameters and at a constant output level. At the end of the lamp's lifetime, the operator is notified to change the lamp.

The OEM TRISTAN monitors and regulates fully-automatically the UV intensity in the running process. Analysis of the UV spectrum in the range of 250 to 550 nm is performed in up to 3 freely-definable control ranges. Changes to the UV intensity are recognized and the process is steered to optimum at all times by the closed control circuit. The spectrometer in use has a resolution of up to 0.15 nm. This guarantees a stable UV process, a consistently high quality and performance, and at the same time reduces the number of rejects.

At the start of production, the optimum UV power for the respective process is registered with the „Teach-In“ function. The power control is performed directly based on the consolidation and sterilization process, and no longer on the electrical input values. Process control is done automatically by means of special software. Measurements can be started by internal timers or by external triggers. The measurement cycle times of the internal timer can be selected freely in the range of 1 sec to 180 sec.

This guarantees exact harmonization with the production cycle. Optical fibers and sensors are re-calibrated with every „Teach-In“. This ensures precise and reliable values with every measurement. The measuring lens is also protected by shutters. With this system, based on the TRISTAN OEM spectrometer with its fast integration time and easy-to-use software interface, it is possible to raise the quality and shorten the time of industrial drying process in one single step. Moreover, the cost-intensive change rate of UV-lamps can be decreased.

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