

UV lamps reduce VOCs and boost uptime

Casting molds and cores for the automotive industry are made from sand and binders. VOCs are released as these molds cure. In this case, the exhaust air temperature reaches up to 70 °C while the relative humidity remains below 5%. As the foundry recently expanded its production, the existing UV system was no longer able to meet the regulatory limit values. The system operator was also dissatisfied with the service life of the standard UV lamps (G-lamps) that had previously been used, as these either had to be replaced very frequently due to high temperatures or no longer delivered the required UV performance.

Cooperation between xpuris and Excelitas

The challenge

Government regulations require companies to comply with emission guidelines. A degradation rate of more than 50% is mandatory. Total volatile organic compounds (VOC) amount to an average of up to 5 kg/h.

The goals

- Achieving maximum VUV output at elevated exhaust air temperatures
- Ensuring compliance with VOC limit values after system upgrade and production expansion
- Reducing operating costs

The solution

Together with the plant manufacturer xpuris, Excelitas developed a low-pressure UV lamp individually optimized for the operating conditions. The new lamp design combines the properties of synthetic and doped quartz glass, enabling ozone generation and CIP cleaning inside the reactor - while providing ozone-free operation outside the reactor.

Advantages of NAQ High-Performance Amalgam Lamps Compared to Conventional Low-Pressure Mercury Lamps:

- Minimal decline in VUV performance over the entire service life
- Low temperature sensitivity of VUV performance
- Cost savings



EFFICIENCY: G-LAMPS VS. AMALGAM LAMPS

Lamp Type	GHO64T5V H/4	NAQ 300/153 XL QS
Power	150 W	310 W
Radiation Flux 185 nm	8,5 W	27 W
Radiation Decrease After 5,000 h at 185 nm	40 %	15%
Radiation Decrease After 10,000 h at 185 nm	< 30 mg/Nm ³	20 %
EI. Power for Radiation Flux of 27 W at 185 nm	83.000 Nm ³ /h	310 W
Number of Lamp Replacements until 50% Intensity Loss at 185 nm	1	rd. 0,3

TECHNICAL DATA OF THE SOLUTION

Temperature	Up to 70 °C
Rel. Humidity	< 5 %
Degradation Rate	> 50 % (70 mg/Nm ³ -> 30 mg/Nm ³)
TA-Luft Limit	< 50 mg/Nm ³
System Limit	< 30 mg/Nm ³
Air Volume	83.000 Nm ³ /h
Ingredients	Amines (Dimethylisopropylamine, Diethylamine, Dimethylpropylamine), Benzene, Phenols, Formaldehyde
VOC total	Up to 5 kg/h average
UV power	Approx. 240 kW max.

