Crowcon Gasmaster on site

Case Study

NMP Detection in China

Crowcon is the first gas detection company to have successfully installed and commissioned a NMP vapour detection system in a domestic Chinese lithium-ion manufacturing plant

The Client

Crowcon has successfully installed a NMP (N-Methyl-2-Pyrrolidone) vapour detection system in a Chinese lithium-ion manufacturing plant, using Xgard fixed heads and a Gasmaster controller.

With the increasing consumer demand for electric vehicles, the requirement for long-life lithium-ion batteries has been increasing steadily over the last few years. According to the China's Ministry of Industry and Information Technology, the year-on-year growth of lithium-ion battery manufacturing in China for the first half year of 2015 is 17.4%. The growing investment in lithium-ion battery manufacture has prompted more companies to start manufacturing these batteries.

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Requirement

The lithium-ion battery making process is complicated and involves many stages. The critical and chemically sensitive stage of Cathode Coating, uses slurries of coating compounds containing NMP as a sizing agent. During the process these slurries are heated and NMP gas is produced. NMP gas is toxic and harmful to the humans. At present, there is still no regulatory limit on the amount of NMP in atmosphere in China.

But in Germany, NMP has been listed as a Class III toxic chemical and the maximum allowable level in the atmosphere is 100µl/L (100ppm). In 2003, NMP was listed as a toxic substance affecting fertility by the European Union and in the UK the Health and Safety Executive EH40 limits are 10ppm for an 8hr long-term time weighted average and 20ppm for short-term (15 min) exposure. In addition, high concentrations of NMP are explosive in air. Therefore, the detection and recycling of NMP is not only important for energy conservation and emission reduction but is also critical for health and safety.

*NMP Chemical name: N-Methyl-2-Pyrrolidone, colorless and transparent oily liquid with a little odor of amine. NMP is irritating to eyes and skin.

Coater used in lithium-ion battery production line

Approach

Crowcon China's sales team have built a trusted relationship with a local Chinese consultant in a previous project that Crowcon worked on.

The team approached the project early and worked with the consultant to provide a comprehensive solution that would address the main issues our client was facing that no other business could provide.

Outcome and Benefits

"The detection and recycling of NMP is not only important for energy conservation and emission reduction, but is also critical for health and safety". Crowcon is the first gas detection company to have successfully installed and commissioned a NMP vapour detection system in a domestic Chinese lithium-ion manufacturing plant.

The system uses Xgard fixed heads and a Gasmaster controller. Xgard heads are rated intrinsically safe (I.S.) and flameproof (Exd) versions are available, with case options of high-grade alloy, stainless steel or chemically resistant GRN polymer. Certifications include IECEx, ATEX and UL,. The maximum working temperature for the heads is 150oC. So the detector heads are ideal for installation in hazardous areas.

Even so, the elevated temperature during the drying process makes installation of any gas detector, including Crowcon's Xgard, difficult. The complex site condition also provided many challenges to Crowcon's technical and service team, but through research and experimenta- tion, a sample system with a gas sampling tube and remote mounted sensor assembly was designed. Using this method, the high temperature environment does not affect sensor performance.

Crowcon succeeded in providing the first NMP gas detection solution lithium-ion battery manufacturing in China.

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Detecting Gas Saving Lives

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