

Scavenging Case Study



On Site Palladium Recovery at Ercros using Smopex®

Introduction

Ercros, Spain manufactured acetaldehyde via the Wacker process. This process adopts a homogeneous palladium catalyst. The customer announced that the production of acetaldehyde at their site would cease and required the palladium to be recovered. The process was carried out in a reactor that contained 30 kilograms of palladium within a solution volume of 50 metric tonnes. Due to the nature of the solution, the volume of liquid and the solids content, the reactor contents was not suitable for direct refining to recover the palladium. Smopex® was offered as a cost effective, alternative method for recovering the palladium.

The Wacker process refers to the oxidation of ethylene to acetaldehyde by oxygen in water in the presence of a palladium (tetrachloropalladate) catalyst. This process employed a homogeneous catalyst and therefore is dispersed throughout the reaction mixture and contained within the reactor itself. It had been determined that the process was no longer to be carried out, and subsequently the reactor was to be shutdown. As the reactor contained the reaction mixture, including the 30 kilograms of palladium, a recovery method for the valuable metal was needed. The entire recovery was required to take place at the customers site.

The target was complete recovery of palladium from the reactor solution whilst minimising handling and transport of the solution, on location at the customer's site by third party processor overseen and coordinated by Johnson Matthey.

The Problem

Results

Results generated from the samples provided by Ercros indicated that both Smopex® 105 and Smopex® 112 were very effective at recovering the palladium. However, the highest metal loadings of palladium per gram of scavenger were seen using Smopex® 105.

Industry:

Chemical manufacturing

Company:

Ercros

Location:

Tarragona, Spain

Process:

Recovery of palladium from the manufacture of acetaldehyde (Wacker process)

Key driver:

Values recovery of palladium from the process at customer

Technical highlights:

- 97% palladium recovery using Smopex® 105
- Entire treatment performed at the customer's site

Key outcome:

The scavenging process performed on site at Ercros returned a total of 93.5% of the palladium back to the customer.

Based on the successful screening results a Technical Proposal was generated for the customer. The palladium recovery process would be conducted on site at the customer using a batch process. A number of treatment proposals were presented to Ercros, including a metal share option.



Smopex® 105 being charged into the palladium bearing solution at the customers site.

Scavenging Technologies frequently works with a third party processor, who in this project both set-up and provided portable batch treatment tanks at the customers site, in addition to performing the Smopex® treatment.

The reactor solution was loaded into the vessels via a tanker and treated with Smopex®. The mixture was allowed to settle overnight. The palladium loaded Smopex® was filtered using a filter press and securely packaged and shipped to Johnson Matthey in the UK. The palladium loaded Smopex® was evaluated and refined by Johnson Matthey and the metal returned to the customer.

Process



Overhead view of the metal recovery operation, including portable treatment tanks and Smopex® fibre ready to be charged.

For additional scavenging case studies and further information, please visit: www.scavengingtechnologies.com.

We can also be contacted by the following methods:

Tel: +44 (0)1763 253000

Fax: +44 (0)1763 253419

Email: scavengingtechnologies@matthey.com

Conclusion

This single one-off treatment of an end of life process yielded a total palladium recovery of 93.5% for the customer. Smopex® was able to offer a viable, practical and cost effective solution to Ercros. In addition, by using our network of contacts and partners we are able to provide solutions and services for metal recovery to customers that would otherwise not be achievable.

Your complete scavenging partner

