

Press release - Technology Major Niches Press Conference on Annual Results 2012

Hanau, May 10, 2012

Platinum is going around in circles

- Nitric acid producers benefit from Heraeus' major expertise in niche areas in numerous ways

For more than 160 years, Heraeus has been proving every day that a niche specialist can be a globally successful company. With 5,900 patents and patent applications, Heraeus is engaged in innovative activities around the world. During financial year 2011, 117 new basic patents were issued to Heraeus, a 25 percent increase over the same period in the previous year. The company invested about €76 million in the development of new products and technologies, and in 2012 the development budget will increase some 16 percent to more than €88 million, as announced by Dr. Frank Heinrich, Chairman of the Heraeus Holding GmbH Board of Management, at the press conference on annual results.

The Group has likewise captured numerous technology-driven special applications and markets with its knowledge of and expertise in using high-tech materials. Heraeus' dominance in many of these niche areas – whether large or small – results from a unique level of vertical integration and product diversity in the processing, application, and combination of precious and special metals, polymers, and quartz glass. For Heraeus, a niche is a technology-driven market segment with only a few providers and special technological challenges.

Platinum gauze is a sizable niche specialist

The major niche products include platinum gauzes, which have a catalytic function that makes them essential to the production of nitric acid. Around 60 million tons of this important basic chemical are produced annually. The majority of it goes into the production of nitrate fertilizers. Since the beginning of the 20th century, this acid has been obtained by burning ammonium over a platinum catalyst. Heraeus has driven the development of this catalyst significantly in the last 100 years, achieving higher yields of nitric acid and almost completely eliminating unwanted by-products of the chemical reaction—such as the ozone-depleting greenhouse gas nitrous oxide.

A catalytic gauze of thin platinum-rhodium wire has been used for the ammonium oxidation process since 1909. The width of the wire is comparable to that of a human hair. Thousands of these fine threads are used to make the valuable gauze by means of special knitting and weaving techniques. Heraeus already has the next generation in the development pipeline: highly active wafers made from platinum-rhodium alloys. These wafers are currently in the testing phase with various customers and are expected to enable an even higher yield of nitric acid, and thus fertilizer, than the gauzes do. "Because ammonia—the raw material for manufacturing nitric acid—is expensive, a catalyst that is half a percent more efficient than its predecessor translates to real money," according to Frank Heinrich.

Today's producers are predominantly using gauzes made with platinum-rhodium alloys with diameters of up to six meters. Depending on their design, the nitric acid plants can contain anywhere from two to 60 of these

fine gauzes—and the high prices of precious metals make them worth millions. However, even a valuable product like this does not last forever. Quite the contrary: a platinum-rhodium gauze system must typically be replaced after several months of use. Even though the catalyst is not consumed during the chemical reaction, it is not immune from natural wear and tear. When used in the nitric acid reactors at temperatures of about 900°C, the catalyst's structure changes, initially improving its efficiency. But with time, the structural changes diminish the catalyst's effectiveness, making replacement necessary periodically. Removing the gauzes for customers is yet another process step for Heraeus.

Precious metals cycle as its own niche

One of Heraeus' particular skills is the mastery of the cycle to recover precious metals. Used catalyst gauzes can be recycled. Using internationally standardized procedures, the gauzes are melted down and carefully separated into the individual components, such as platinum and rhodium. The recovered, purified precious metals can then be turned back into wires and used to make new gauzes. In this way, the precious metals cycle conserves the resource of strategically important precious metals and helps protect the environment over the long term.

Precious metals trading plays a key role in this cycle, taking over the entire spectrum of precious metals management for customers. Clients who need platinum-rhodium alloy catalyst gauzes from Heraeus for their factories can secure the price of the precious metals required for the gauzes in a price hedging deal with the trading department early in a project, thereby creating a stable basis for calculations. Trading then ensures that metal at the correct purity grade is available at the start of production. The close integration of trading, recycling, and product divisions enables Heraeus to offer its customers an uninterrupted flow of recyclables. Only a few companies in the world have mastered this complex cycle in its entirety, as Heraeus has.

Heraeus, the precious metals and technology group headquartered in Hanau, Germany, is a global, private company with over 160 years of tradition. Our fields of competence include precious metals, materials and technologies; sensors; biomaterials and medical products, as well as dental products, quartz glass, and specialty light sources. With product revenues of €4.8 billion and precious metals trading revenues of €21.3 billion, as well as more than 13,300 employees in over 120 subsidiaries worldwide, Heraeus holds a leading position in its global markets.

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