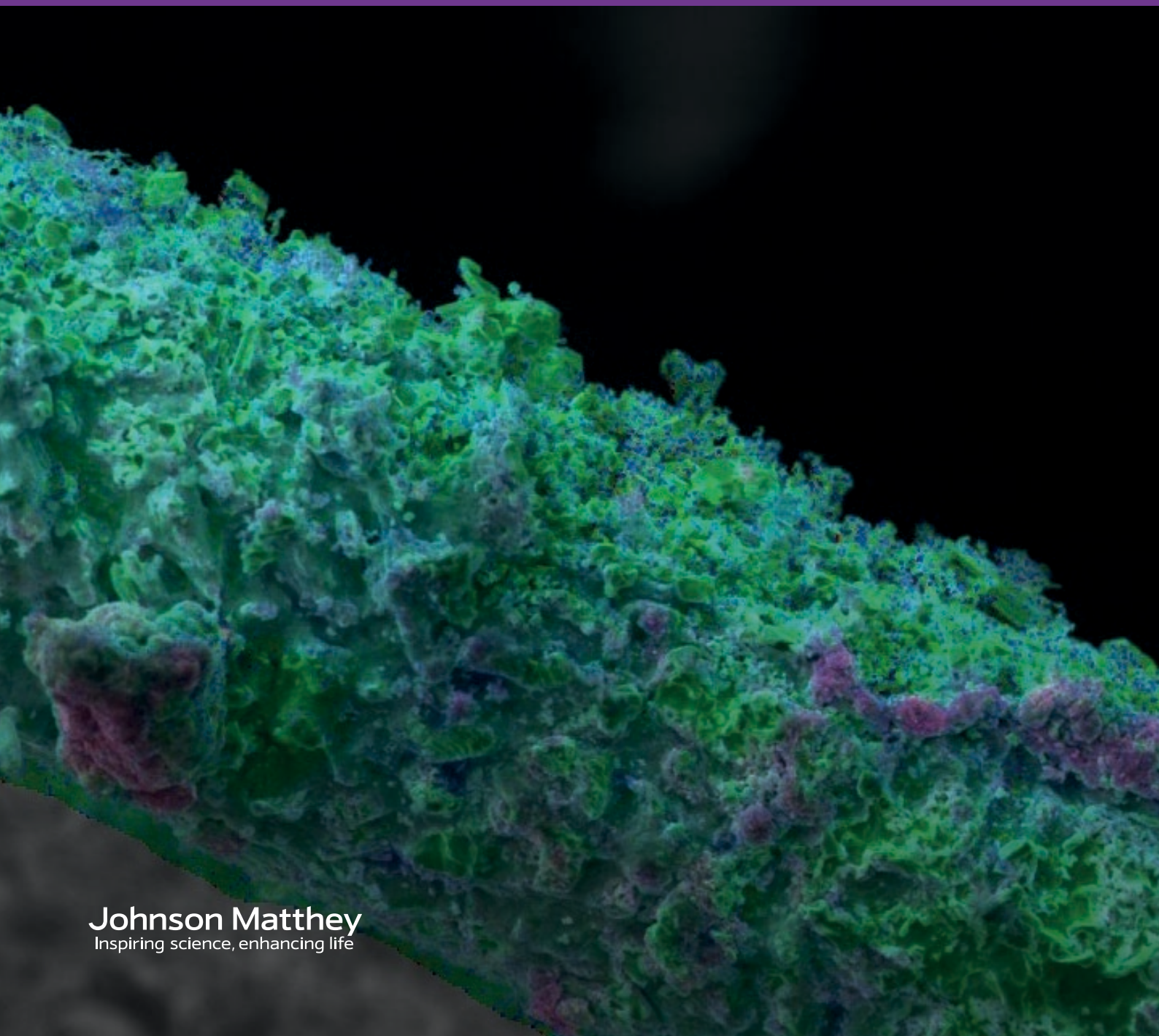


# JM

## Nitro technologies: metal utilisation



# Reduction in PGM content for high pressure nitric acid plants

## ECO-CAT benefits applicable to high pressure operation

The total installed PGM content of an ammonia oxidation catalyst is a key element of the overall cost of the system. Through our expertise in PGM chemistry and metallurgy JM can use **ECO-CAT™** to optimise the PGM's (Fig1).

Nitric acid plants operating at high pressures (> 9 barg) and with a high nitrogen loading (> 60 teN/m<sup>2</sup>/d) have high metal loadings in the range of 600 – 900 mg installed PGM content per tonne of acid produced in a campaign. Lower pressure and loading plants typically see a range of 200 – 500 mg/te installed PGM content.

**ECO-CAT** technology, which incorporates palladium-rich alloys into the catalyst pack, is in widespread use and is the recommended technology for medium and dual pressure plants. The **ECO-CAT** pack uses palladium in a controlled manner to replace some of the platinum in the gauze. Exploiting its metal recovery properties, the palladium catches lost platinum without compromising the ammonia conversion.

A nitric acid producer located in the Asia-Pacific region benefited from a 15% reduction in their catalyst system installed weight compared to standard technology, reducing the installed PGM value of the system by over £40,000.

Additionally, the utilisation of captured platinum within the pack resulted in a higher conversion efficiency towards the end of the campaign. Further optimisation of palladium placement within the pack resulted in a reduction in N<sub>2</sub>O emissions from the system.

By applying **ECO-CAT** design principles to high pressure and high loading plants, the installed metal content can be significantly reduced (Fig 2). Additional benefits associated with **ECO-CAT** technology include reduced net pgm loss, lower N<sub>2</sub>O emissions and improved campaign efficiency.

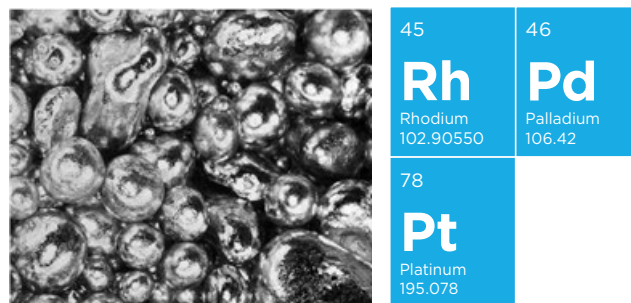


Figure 1: PGM feedstock as casting grains

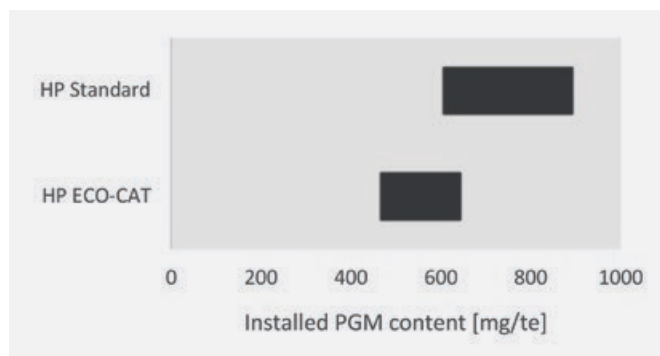


Figure 2: Installed metal content range (as mg installed per tonne acid produced) for high pressure nitric acid plants