Recovery of precious metals from spent catalysts using Tetronics patented technology offers higher performance and a commercial advantage over alternative recovery solutions.

**BENEFITS**

1. Industry leading recovery rates, >98.5% typically achieved
2. Rapid precious metal returns in a closed loop system
3. Decades of experience delivering precious metal recovery systems
4. Lower capital and operating costs than competing technologies
5. Process applicable to a range of different precious metals
6. Intensive, modular process with a small footprint
7. Spent catalyst substrates are vitrified into a valuable building product - Plasmarok®

**WHAT ARE SPENT CATALYSTS?**

Spent catalysts, or catalyst wastes, including automotive catalytic converters and industrial catalysts (e.g. from the chemical and petrochemical industries) contain Precious Metals (PMs), specifically the Platinum Group Metals (PGMs), which are valuable due to their low natural abundance, unique properties and the complex processes that are required for their extraction and refining from primary sources.

**PRECIOUS METAL RECOVERY - THE CHALLENGES**

Whilst PGMs are found as naturally occurring ores, these metals may also be obtained by recycling PGM bearing wastes. These waste streams are typically orders of magnitude richer in PGMs than their naturally occurring ore equivalents, therefore recycling these wastes helps to conserve natural resources. PGMs have outstanding catalytic properties and wastes suitable for recovery include: crushed autocatalyst ceramic monolith, catalytic soot filters or heterogeneous process catalyst on a variety of different substrates.

In recent years there has been a steady increase in the amount of PMs and PGMs being recovered from secondary sources, driven in large part by high commodity prices and a rapid growth in auto-catalyst recycling. The scarcity of these precious metals, alongside the increasing costs and complexities involved in their extraction from primary sources, compared with the lower costs and environmental impacts of recycling-based extraction has provided added incentives for this growing trend.

**HOW TETRONICS CAN HELP**

Tetronics’ patented plasma systems offer considerable competitive advantage over alternative methods of obtaining precious metals, including: cupellation, hydrometallurgical leaching and thermal decomposition and/or recovery processes. Table 1 on the reverse of this sheet summarises some of the key distinguishing features of the most prevalent recovery techniques.

Tetronics’ systems utilise a state-of-the-art, high temperature plasma smelting technology to recover the PGMs contained within the catalyst wastes as a concentrated metal alloy. This alloy is subjected to further chemical refining (either in house or by third parties) before the metals re-enter the product supply chain, hence, closing the recycling loop.
Catalyst recovery has both significant cost and environmental advantages. In addition to the recovery of PGMs, the Plasmarok® product of the process finds application as an aggregate in a wide range of traditional building applications, due to its inert, low leaching character. In the case of ‘auto-cats’ the metal casings are recycled using traditional routes.

Subject to waste availability, the high specific values of these waste streams provide a compelling justification for investment in a plasma based PM recovery plant; capital payback is typically achieved within 1–2 years at waste throughputs of 1,500–2,000 tonnes per year.

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<th>TABLE 1: A summary of the key distinguishing features of the most prevalent recovery techniques</th>
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Contact Tetronics to find out how we can assist with your spent catalysts challenge.