Tetronics International

# Tetronics: Plasma Treatment of Hazardous Waste

## Tetronics Benefits:

Gasification of carbonaceous components, which greatly reduces the mass and volume of the waste stream, with the potential to generate a synthesis gas (a fuel) or steam

Provides a future proof solution to future tax, regulation and gate fee uncertainties removing a key business risk

Vitrification of the inorganic fraction to produce a dense, environmentally stable Plasmarok® – a product that has the ability to generate value as it may be used in a range of building applications

Technology is tolerant of chemically challenging waste feeds and is simple to operate and maintain

Encapsulation of hazardous metallic species within the Plasmarok® phase

High Destruction and Removal Efficiencies (DREs)

Intensive, compact process plant package that can be readily retrofitted adjacent to existing installations

Control of power input independently of process chemistry

## Treatment of hazardous waste using Tetronics' technology offers commercial advantage over existing waste management options while reducing landfill liabilities and conserving natural resources.

### About Tetronics:

Tetronics International is the global leader in the supply of Waste Recovery Plants. We have the capability to manage the complete deployment lifecycle of a Waste Recovery Plant from initial testing of the waste material at Tetronics' test facility, the most comprehensive in Europe, through to the physical onsite installation of a full commercial plant, and subsequent support and maintenance.

Tetronics' patented Direct Current (DC) Plasma Arc plant technology provides the closest solution to Zero Waste currently available. This "green" sustainable alternative for waste management uses ultra-high temperatures to melt, gasify or vaporize any waste material, in order to treat, recover or generate useful commercial products.

As a pioneer in using plasma technology for waste treatment, our multi-faceted, highly qualified research and engineering team have applied the technology to an unrivalled range of waste challenges.

Our technology has been tried and tested over five decades and has been used globally in more than 80 plants across a wide and varied range of applications.

These applications include, but are not limited to: transforming hazardous waste into environmentally safe building aggregate, recovering precious metals from spent catalysts, recovering energy from waste oil, reducing the volume of radioactive materials and improving the quality and efficiency of steel production.

Our principal aim is to provide sustainable and future proof solutions to support organizations in recovering value from their waste materials while meeting their waste disposal and carbon footprint challenges.

### What is Hazardous Waste:

Example wastes include: Air Pollution Control (APC) residues, Asbestos Containing Materials (ACM), Persistent Organic Pollutants (POPs) including Polychlorinated Biphenyl (PCB) contaminated soils & sludges, Spent Potlinter (SPL) and Pyrometallurgical wastes including Electric Arc Furnace (EAF) dusts.



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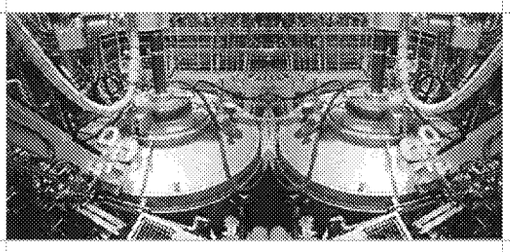

## Hazardous Waste Challenges:

Currently, within the Environmental or Integrated Waste Management sector, there is a climate of rising costs, limited numbers of technology provider options and significant levels of market consolidation. Traditionally, the Environmental Sector has operated with basic mixing technology solutions, e.g. physiochemical consolidation, physiochemical separation, neutralisation and basic material bulking (dilution), with ultimate reliance on landfill and High Temperature Incineration (HTI).

Within Europe, the impact of national statute derived from the adoption of the Landfill Directive 1999/31/EC, Integrated Pollution Prevention and Control (IPPC) Directive 96/61/EC and Waste Incineration Directive 2000/76/EC, has demanded technological advancement for continued compliance. Similar legislative drivers are seen worldwide. The impact of these changes has been magnified by other factors such as the landfill tax escalators, the requirement for pre-treatment to meet WAC and the end of co-disposal, which has limited the number of accessible hazardous waste landfill sites.

By way of example, APC residues which are a mixture of fly ash, organic pollutants (including dioxins and furans), carbon and alkaline salts in powder form are classified as hazardous waste. They are generated from processes associated with operation of Municipal Solid Waste (MSW) incinerators (approximately 80% generated by this route) and other thermal processes for the treatment of waste. APC residues typically account for approximately 3.5% by weight of waste throughput for thermal treatment technologies currently operating in Europe. Using population normalised data, the total APC residues arising in the UK in 2007/8 was 160 kilo tonnes. The total cost of sending the UK's APC residues to landfill (the principal disposal route at present) was £20.2 million in 2008 and escalating. During the course of 2010, the unit treatment cost is anticipated to climb by >15%, due to taxation and regulatory pressures, and will continue to do so over future years.

## How Tetronics Can Help:

Tetronics offers Waste Recovery Plants to meet a growing number of waste management challenges including the recovery of hazardous and chemically difficult wastes. Recovery of waste using Tetronics' technology offers a commercially advantageous solution to existing waste management problems whilst reducing landfill liabilities and conserving natural resources.

## How Tetronics' Technology Works:

In plasma-enhanced treatment technology, waste arisings are fed into a sealed furnace and heated in a controlled environment using the plasma arc created by single or multiple plasma electrodes/torches. The process chemistry is designed to separate any valuable recoverable components from the less valuable material, which is then converted to a re-useable vitrified product, Plasmarok™ in a single processing step.

The use of plasma arc technologies, especially in the treatment of hazardous wastes, is set to expand. Being a recovery as opposed to a disposal process, the technology is intermediate within the waste management hierarchy and is characterised as an Advanced Conversion Technique (ACT) with Best Available Technique (BAT) attributes.

Contact Tetronics to find out how we can assist with your Hazardous Waste Challenge.

*Tetronics' experience in the application of plasma technology has resulted in an enviable international reputation, not only for the quality of plasma systems but also for the depth of technical expertise.*

**Fichtner:**
a leading engineering, project management and technical advisor to the waste management, process and renewable energy sectors.

*Plasmarok* is a dense, mechanically strong and environmentally benign product that can generate value as it may be readily employed in a range of building applications.

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