Applications

- **Combustion** —
The complete combustion of flame retardant material, like heavy fuel oil, or waste oil, through pyrolysis.

- **Waste Treatments** —
  Hazardous wastes disposal (Including solid, liquid and gas).

- **Electronics** —
  Liguid waste & exhaust gas treatment, Surface cleaning and treatment.

- **Chemical Processings** —
  High-temperature needed processing.

- **Biotechnologys**
  Toxic material and lab wastes disposal.

- **Metallurgies** —
  Metal melting, Susface thermal treatment.

- **R & D Laboratories** —
  Heat-resistant material testing, High-temperature environment simulation.
何謂電漿？

電漿（Plasma）為固體、液體及氣體等物質三態外之第四種形態，係由正離子、電子、原子和分子等物質所組成。電漿火焰中心溫度可達5,000 ~ 10,000°C以上，並產生2,000°C以上的高溫操作環境（依爐體材質而定），與強烈的紫外光線。

與市面上傳統的燃燒加熱方式相比，電漿加熱系統除了能產生更高的溫度外，更具有以下優點：
- 透過超高的熱傳效率，使高溫反應區之反應速率比燃燒式快十倍以上。
- 利用解離氣體的不同化學特性，達成不同的反應溫度和效果。
- 氣體電漿化過程中損失較少的能量，可將能量作最有效的運用。
- 加熱過程採電能控制，增加安全性及系統掌控性。
- 可在缺氧或無氧環境下，將物質直接熱裂解。
- 電漿焰含有豐富的UV光，可加速化學反應。

What is Plasma?

"Plasma" is the fourth state of matter, after solid, liquid, and gas, and it is constituted by ions, electrons, atoms, and molecules. The core temperature of plasma flame can be as high as 10,000°C. Furthermore, the whole system can easily create an environment of a temperature over 2,000°C (depending on the material of chamber) as well as a large mass of UV rays.

Compared to the traditional burning method, our system is not only providing a higher temperature environment, but also offering following advantages:
- Through the high heat conductivity, Plasma is 10 times faster to achieve such high temperature.
- Depending on the chemical characteristics, using different gas would bring the different temperature and effects to the result.
- Less of energy lost during the process, which can maximize the usage of energy.
- A safer and easier control by using electricity power.
- The system can directly disintegrate matters under a oxygen-starved environment.
- The flame contains a lot of UV rays, which can speed up the chemical reactions.

系統架構

- 電漿火焰 - 冷陰極式或熱陰極式
- 電源供應器
- 氣體控制系統
- 水冷系統(選購)
- 人機界面電腦控制系統(選購)
- 氣體質量流量控制器(選購)
- 電壓及電流資料記錄設備(選購)

Components of the System

- Plasma Torch: Cold or Thermal Cathode Type
- Power Supply
- Gas Control System
- Water Cooling System (Optional)
- Human Machine Interface Control Panel (Optional)
- Gas Mass Flow Controller (Optional)
- Voltage and Current Data Recorder (Optional)

系統連接圖 System Connection
Cold-Cathode Type Plasma Torch

- Available in the types of “Transferred” or “Non-Transferred.”
- Special alloy made body.
- Designable diameter and length of the flame.
  (Diameter from 10 to 100mm, and length from 50 to 1,000mm)
- Suitable gas: Air, Argon, Nitrogen, Oxygen, and Mixed Gas (Ar + H₂, N₂ + H₂, O₂+N₂ or Ar + N₂) etc.

Thermal-Cathode Type Plasma Torch

- Available in the types of “Transferred” or “Non-Transferred”
- Special alloy made body.
- Designable diameter and length for the flame.
  (Diameter from 5 to 20mm, and length form 30 to 200mm)
- Use high heat-resistant material as cathode to reduce the consumption of electrodes and keep the heating subject clean.
- Suitable gas: Argon, Nitrogen, and Mixed Gas (Ar + H₂, N₂ + H₂, or Ar + N₂) etc.
電源供應器

- 定電流控制，直流電輸出。
- 熱源使用溫度回饋控制和全密閉電控迴路系統，可恆控爐體反應溫度。
- 全日24小時全載連續運轉，最長可達一個月以上。
- 使用開關式電源技術，輸出電流最穩定，濾波率≤5%，功率因數≥90%。
- 可選配全數位觸控屏幕，達到全自動化之要求。

Power Supply

- Constant current controlled DC output.
- The heating source is controlled by temperature feedback and electronic circuit system, which makes the temperature in the chamber stay constantly.
- Reliable operating for 24 hours and maximum for more than one month constantly.
- Using the technology of switching power for the most constant output current. (With a ripple rate ≤5%, and a power factor ≥90%.)
- Digital touch panel can be supplied as optional for the complete automation.

水冷系統

- 移除火炬內部熱能，使火炬各零組件保持在適當操作溫度並減少電極消耗。

Water Cooling System:

- Keeping the parts of the torch at a proper operating temperature, which reduces the consumption of the electrodes.

人機介面電腦控制系統

- 觸控式面板加上數位化控制，讓操作更為簡單。

Human Machine Interface Controlled Panel

- Using the touch panel and digital control for a user-friendly operating interface.

氣體控制系統

- 使用氣體廣泛：\( \text{O}_2 \)、\( \text{Air} \)、\( \text{N}_2 \)、\( \text{Ar} \)、水蒸氣或混合氣體 (\( \text{Ar} + \text{H}_2 \), \( \text{N}_2 + \text{H}_2 \) or \( \text{Ar} + \text{N}_2 \)) 等。

Gas Control System

- The suitable gas includes \( \text{O}_2 \), \( \text{Air} \), \( \text{N}_2 \), \( \text{Ar} \), steam or mixed gas (\( \text{Ar} + \text{H}_2 \), \( \text{N}_2 + \text{H}_2 \), or \( \text{Ar} + \text{N}_2 \)) etc.

電壓電流記錄設備

- 電腦介面數據截取控制箱，搭配電腦軟體做記錄。

Voltage and Current Data Recorder

- Recording the data of voltage and current for diagnosing.
應用領域

廢棄物處理
電漿火炬所產生的高溫能夠用來破壞多種有害廢棄物，包括有機或無機物質、製程尾氣、醫療廢棄物、低放射性廢料、金屬飛灰灰灰及其它有害事業廢棄物……等。此外，它也可用來減少廢棄物體積並燒結成玻璃化以做安定掩埋。

電子產業
對於半導體等製程尾氣所含CF₄及C₂F₆氣體，以電漿火炬裂解處理去除非效率可達90%。

生質能熱裂解應用
電漿的高能量特性，能使廢棄物(如農業廢棄物)在缺氧的情況下，直接裂解成簡單的分子，單位分子再行轉換成可燃性氣體如CO、H₂或CH₄，由於反應時間短，因此不易形成結構較複雜之物質。

生物科技業
生技研發過程所產生的廢棄物，可能帶有大量病菌的感染性或傳染性物質，因此必須謹慎處理，使污染源不再擴大。採用電漿火炬處理，由於事先不需要經過分離破碎等前處理，大大地降低了因人員疏失所造成的感染可能性，以及省卻了前處理的步驟，除了節省許多時間和降低成本之外，並具備有在一般焚化爐不能處理不可燃物的優點。

研究開發單位
其它研究開發單位需超高溫加熱反應器，如耐熱材料的試驗、或奈米材料研究等。

Applications

Waste Treatments
The heat created by the system can destroy variety kinds of wastes, which include organic or inorganic substances, exhausts from electronic or chemical processing, infectious, low-level radioactive, and other hazardous wastes...etc. Moreover, the system can also reduce the volume of wastes to small pieces of vitrified slag for stable landfill.

Electronic Industries
The heating system can achieve a 99% of Destruction and Removal Efficiency (DRE) for CF₄ and C₂F₆ from semiconductor processing.

Biomass Energy
Plasma, with the thermochemical properties, can directly disintegrate wastes (such as agricultural wastes) into fragments of compounds in the oxygen-starved environment. The compounds can then be converted into combustible gas, such as CO, H₂ or CH₄. As the high temperature of plasma can reduce the reacting time for pyrolysis, it is less likely that the compounds with complex structures will be created during the processing.

Biotechnology
The wastes created during the development of biotechnology contain a lot of germs or materials that is toxic or infectious. With the extremely high temperature of our Plasma Heating System, it can completely, safely, and instantly destroy all kinds of organic materials in the wastes, which can be done by traditional incinerators.

R & D Laboratories
The system can also be used to do any kinds of experiment or processing which needs a very high temperature, for example, the developments of heat-resistant or nano materials.
## Specifications

**With Cold-Cathode Type Plasma Torch**

<table>
<thead>
<tr>
<th>规格(SPEC)</th>
<th>型號/MODEL</th>
<th>PHS-15C</th>
<th>PHS-40C</th>
<th>PHS-100C</th>
<th>PHS-300C</th>
<th>PHS-500C</th>
<th>PHS-1000C</th>
<th>PHS-1500C</th>
</tr>
</thead>
<tbody>
<tr>
<td>入力電壓 Input Voltage</td>
<td>三相 Three Phase, 220V ~ 11.4KV, 60Hz</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>結出電流 Output Current</td>
<td>50A</td>
<td>100A</td>
<td>200A</td>
<td>500A</td>
<td>700A</td>
<td>1000A</td>
<td>1200A</td>
<td></td>
</tr>
<tr>
<td>最大輸出電壓 Max Output Voltage</td>
<td>300VDC</td>
<td>400VDC</td>
<td>500VDC</td>
<td>600VDC</td>
<td>700VDC</td>
<td>1000VDC</td>
<td>1250VDC</td>
<td></td>
</tr>
<tr>
<td>預定輸出功率 Output Power</td>
<td>15KW</td>
<td>40KW</td>
<td>100KW</td>
<td>300KW</td>
<td>500KW</td>
<td>1.0MW</td>
<td>1.5MW</td>
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</tr>
<tr>
<td>定格輸入 Input Power</td>
<td>18KVA</td>
<td>45KVA</td>
<td>110KVA</td>
<td>335KVA</td>
<td>560KVA</td>
<td>1120KVA</td>
<td>1700KVA</td>
<td></td>
</tr>
</tbody>
</table>

Remark: Different Input Frequency and Voltage can be Supplied upon Request.

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## Specifications

**With Thermal-Cathode Type Plasma Torch**

<table>
<thead>
<tr>
<th>规格(SPEC)</th>
<th>型號/MODEL</th>
<th>PHS-4T</th>
<th>PHS-15T</th>
<th>PHS-40T</th>
<th>PHS-60T</th>
<th>PHS-100T</th>
<th>PHS-200T</th>
</tr>
</thead>
<tbody>
<tr>
<td>入力電壓 Input Voltage</td>
<td>三相 Three Phase, 220V, 60Hz</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>結出電流 Output Current</td>
<td>100A</td>
<td>250A</td>
<td>500A</td>
<td>500A</td>
<td>500A</td>
<td>800A</td>
<td></td>
</tr>
<tr>
<td>最大輸出電壓 Max Output Voltage</td>
<td>40V</td>
<td>60V</td>
<td>80V</td>
<td>120V</td>
<td>200V</td>
<td>250V</td>
<td></td>
</tr>
<tr>
<td>預定輸出功率 Output Power</td>
<td>4KW</td>
<td>15KW</td>
<td>40KW</td>
<td>60KW</td>
<td>100KW</td>
<td>200KW</td>
<td></td>
</tr>
<tr>
<td>定格輸入 Input Power</td>
<td>5KVA</td>
<td>18KVA</td>
<td>45KVA</td>
<td>66KVA</td>
<td>110KVA</td>
<td>225KVA</td>
<td></td>
</tr>
</tbody>
</table>

Remark: Different Input Frequency and Voltage can be Supplied upon Request.

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本公司另有生產下列產品，歡迎洽詢:
- 各式切割焊接機
- 電漿噴塗設備(耐磨耗、抗腐蝕)
- 電漿粉末焊接機(PTA)
- 訂製電漿電源供應機

We also have the following products available for your needs:
- Variety Types of Cutting and Welding Machines
- Plasma Coating System (for Wear & Corrosion Resistant)
- Plasma Transferred Arc (PTA) Welding Machines
- Customized Plasma Power Supply Units

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