

# 創新分離式蓄熱燃燒系統開發計畫(105-106)

## 高效率蓄熱式燃燒系統研究計畫(104)

執行單位

財團法人金屬工業研究發展中心

計畫主持人

林恒育

- 發展蓄熱燃燒系統與工業爐整合設計及開發能力，並透過研發關鍵組件促進蓄熱燃燒服務業與爐體製造業發展，建立系統整合應用典範，滿足國內目前鋼鐵、鑄造、金屬零組件等相關產業工業爐製程要求，達到節能減排目的。

### 專利申請

1. 專利佈局方向(104-106)
  - 爐體與蓄熱系統整合(2案3件)
  - 高溫材料與熱處理(3案3件)
  - 蓄熱模組與換向系統(2案3件)
  - 蓄熱式燃燒與控制系統(4案5件)
2. 專利獲證
  - 抗熱震之多孔性續熱材料的燒結方法(104)(專利號：I576329)
  - 具有熱流場均勻化之蓄熱式燃燒器(104)(專利號：I572841)



蓄熱式燃燒系統應用  
精密鑄造產業燒結爐



蓄熱式燃燒系統應用  
金屬製品業固溶化爐



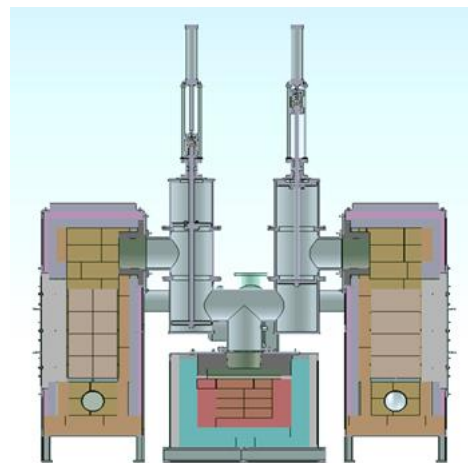
年度技轉簽約儀式暨蓄熱燃燒產業聯盟技術交流會

# 創新分離式蓄熱燃燒系統開發計畫(105-106)

## 高效率蓄熱式燃燒系統研究計畫(104)

執行單位：財團法人金屬工業研究發展中心  
所屬部會：經濟部能源局

台灣的鋼鐵、鑄造、熱處理、金屬製品等產業的燃燒加熱製程有許多廢熱回收機會，為滿足爐溫均勻性，達到高值化金屬產品的需求，本計畫透過創新高溫製程材料、工程理論模擬設計與燃燒、蓄熱、控制等關鍵次系統開發，建立各式的蓄熱燃燒系統與工業爐整合案例，目前已成功應用於盛鋼桶預熱設備、殼模燒結爐以及不鏽鋼固溶化爐等爐型，提供業者節省天然氣使用量達  $30 \pm 10\%$ 。同時，本計畫籌組蓄熱燃燒產業聯盟，並透過技術移轉促進蓄熱燃燒服務業與爐體製造業發展，未來將用以服務國內高溫製程所需，在確保產品品質的要求下，協助廠商大幅節省能源的使用，並減少二氧化碳排放及空污的影響，符合台灣在節能環保的要求及全球的趨勢。



分離式蓄熱燃燒系統



蓄熱系統具高熱效率、安全、高施作品質及易維護之特色

# Development of Split Type Heat Regenerative Combustion Systems (105-106)

## Development of High Efficiency Heat Regenerative Combustion Systems (104)

Execution Unit

Metal Industries Research & Development Centre

Project Director

Lin, Heng-Yu

- This project dedicate to develop the capabilities of integrated design of heat regenerative combustion systems and industrial furnace. Through the development of key components and the demo site of the heat regenerative system and transfer to industries, this project promote heat regenerative combustion services and related furnace manufacturing industries. Our goal is to help end users from current domestic steel, casting, metal components companies to meet their heating process requirements, save energy cost and reduce waste heat emission.

### Patent layout (104-106)

- Integration of industrial furnace and heat regenerative combustion system (3 cases)
- High temperature materials and heat treatment(3 cases)
- Regenerative module and reversing system(3 cases)
- Regenerative combustion and control system (5 cases)

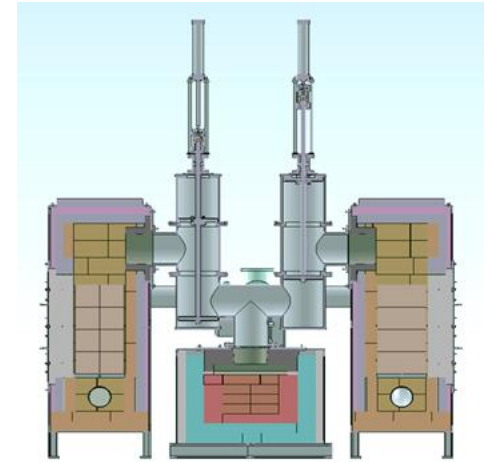


Regenerative combustion system integration application of mold sintering furnace(Left hand side) and solution treatment furnace(Right hand side)

# Development of Split Type Heat Regenerative Combustion Systems (105-106)

## Development of High Efficiency Heat Regenerative Combustion Systems (104)

- In Taiwan, there are many waste heat recovery opportunities in the combustion heating process in industries such as steel, foundry, heat treatment and metal products. This project dedicated to develop innovative high-temperature process materials, engineering design and simulation theories, and key subsystems such as combustion, heat regenerative and control systems. We have built up a variety of heat regenerative industrial furnaces which have been successfully used in steel ladle preheating equipment, shell mold sintering furnace and solution treatment furnace for stainless steel , and provide the industry to save the amount of natural gas up to  $30 \pm 10\%$ . The project has organized an alliance of heat regenerative combustion industry, and promoted the development furnace industry through technology transfer. In the future, it will be used to serve the needs of domestic high-temperature process industries, assisting manufacturers in ensuring product quality, significant savings in energy use, and to reduce the impact of carbon dioxide emissions and air pollution, in line with Taiwan's energy saving and environmental protection requirements and global trends.



Split Type Heat Regenerative Combustion Systems



Heat regenerative combustion furnace  
第二期能源國家型科技計畫  
National Energy Program-Phase II