Process Intensification and Compact Technologies

Heatric Story

Renaud Le Pierres – Business Development Engineer – 10 February 2026

Parker

ENGINEERING YOUR SUCCESS.

PARKER

INTRODUCTION

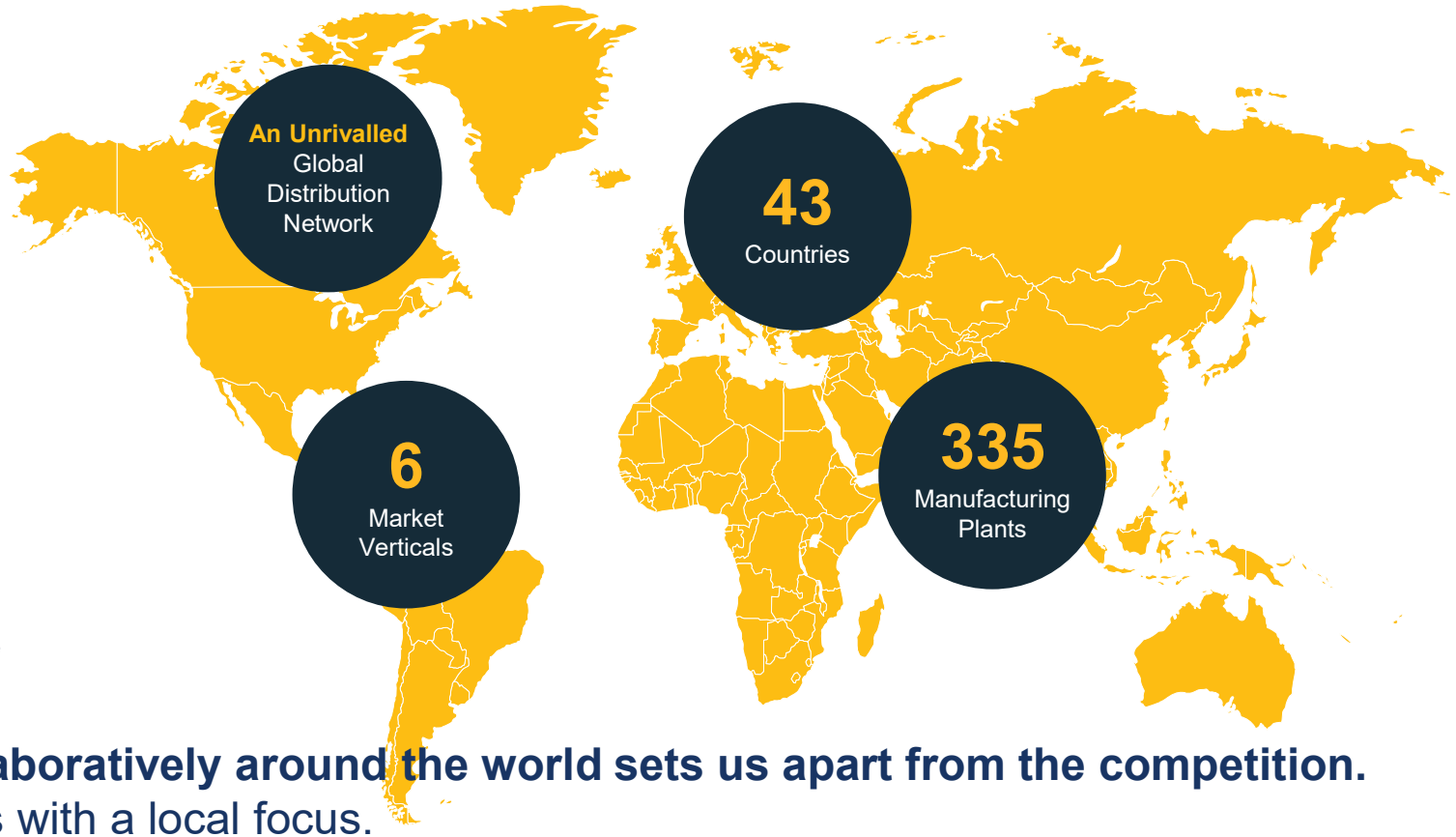
Parker at a Glance FY24

3,000+
Product lines

$19.9 Billion
In global revenue

~765,000
Products sold

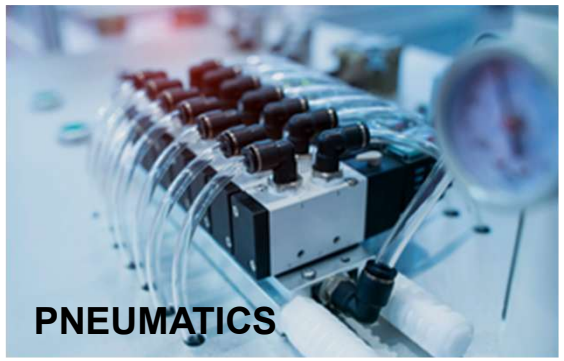
~61,000
Team members worldwide

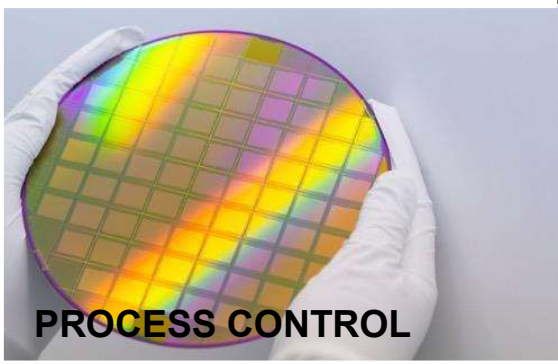


Our ability to work collaboratively around the world sets us apart from the competition.
We are a global business with a local focus.

Parker Core Technologies

Parker provides an unparalleled range of products and solutions in an array of diversified industrial and aerospace markets.





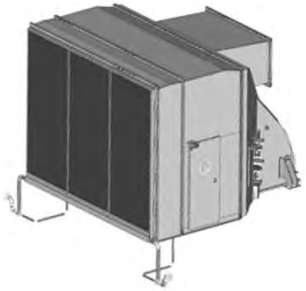
PARKER FES

INTRODUCTION

Filtration & Energy Solutions Division (FES)

Heatric

altair®



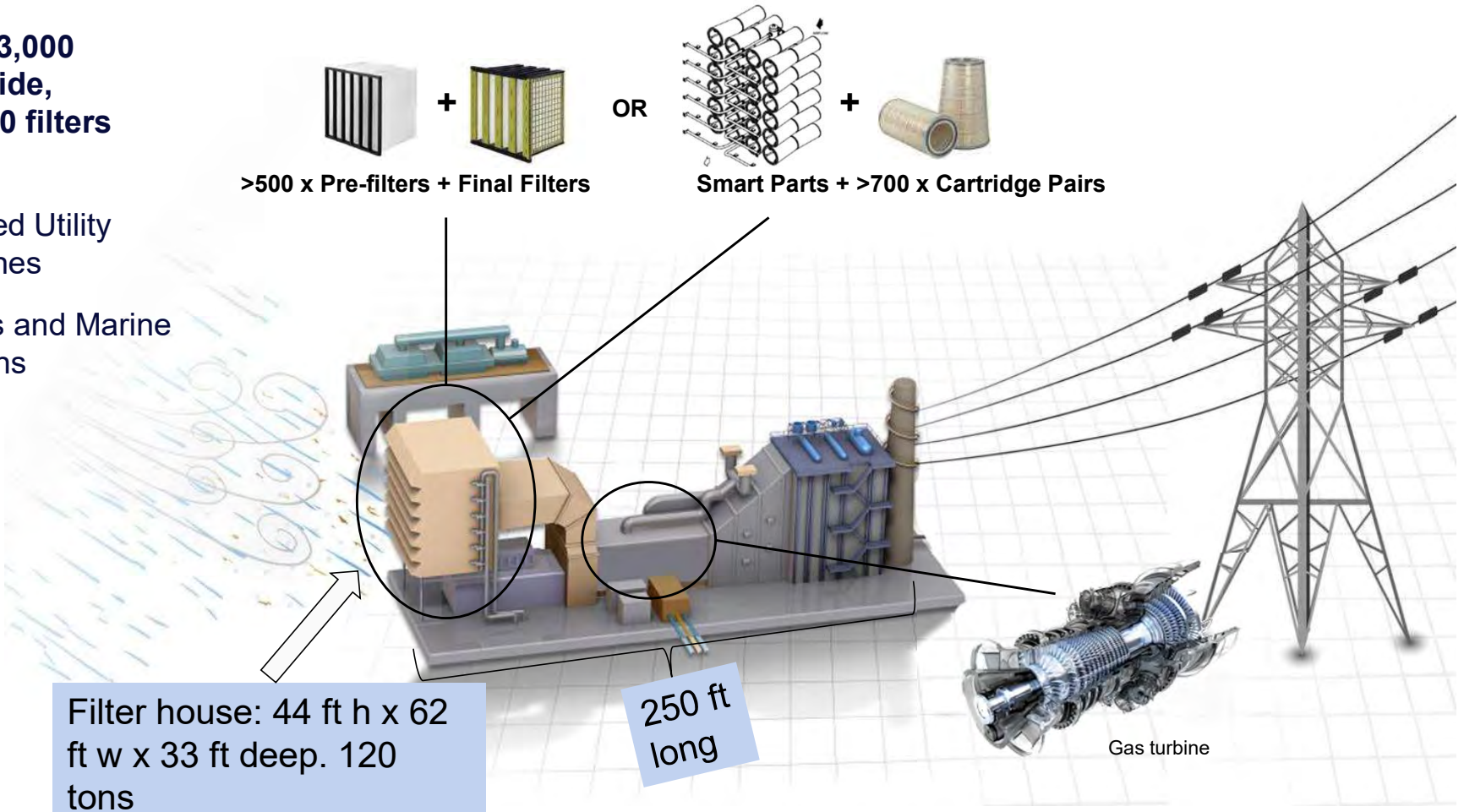
clearcurrent®

A Typical Gas Turbine PowerGen Set Up (>250MW)

Protecting over 3,000 turbines worldwide, with over 550,000 filters installed.

~ 1,000 land-based Utility applications turbines

> 2,000 Oil & Gas and Marine turbine applications



Heatric PCHE

Printed Circuit Heat Exchanger

High Performance

Temperatures from cryogenic to 900°C; with a pressure capability >700 bar

Compact Nature

Up to 85% smaller than conventional heat exchanger technologies

In-house, Fully Bespoke Design

Custom plate flow designs maximize customer process efficiency

Safety First

100% fire resistant materials & no requirement for over pressure relief

Market Sectors

Offshore Gas

Heatric's experience in the offshore industry is unrivalled and our PCHEs are renowned for their performance and safe operation in high integrity gas processes.

Printed circuit heat exchangers enable significant reduction in the space and weight of the topside equipment; saving our customers significant capital costs.

Onshore Gas

Heatric PCHEs deliver better thermal performance than other solutions and feature superior mechanical integrity. This results in improved plant efficiency and up-time for our customers.

Heatric PCHEs have capabilities to handle cryogenic temperatures up to -196°C (-260°F); allowing for operation in LNG processing.

Power Generation

Heatric PCHEs have experience delivering exceptional thermal performance in cutting-edge power cycles using supercritical CO2 (sCO2) working fluids.

From energy storage applications, to innovative waste heat recovery concepts, Heatric PCHEs are an enabling industry technology helping to diversify the modern energy landscape.

PROCESS INTENSIFICATION

SMR - FT

Process Intensification

SMR – FT

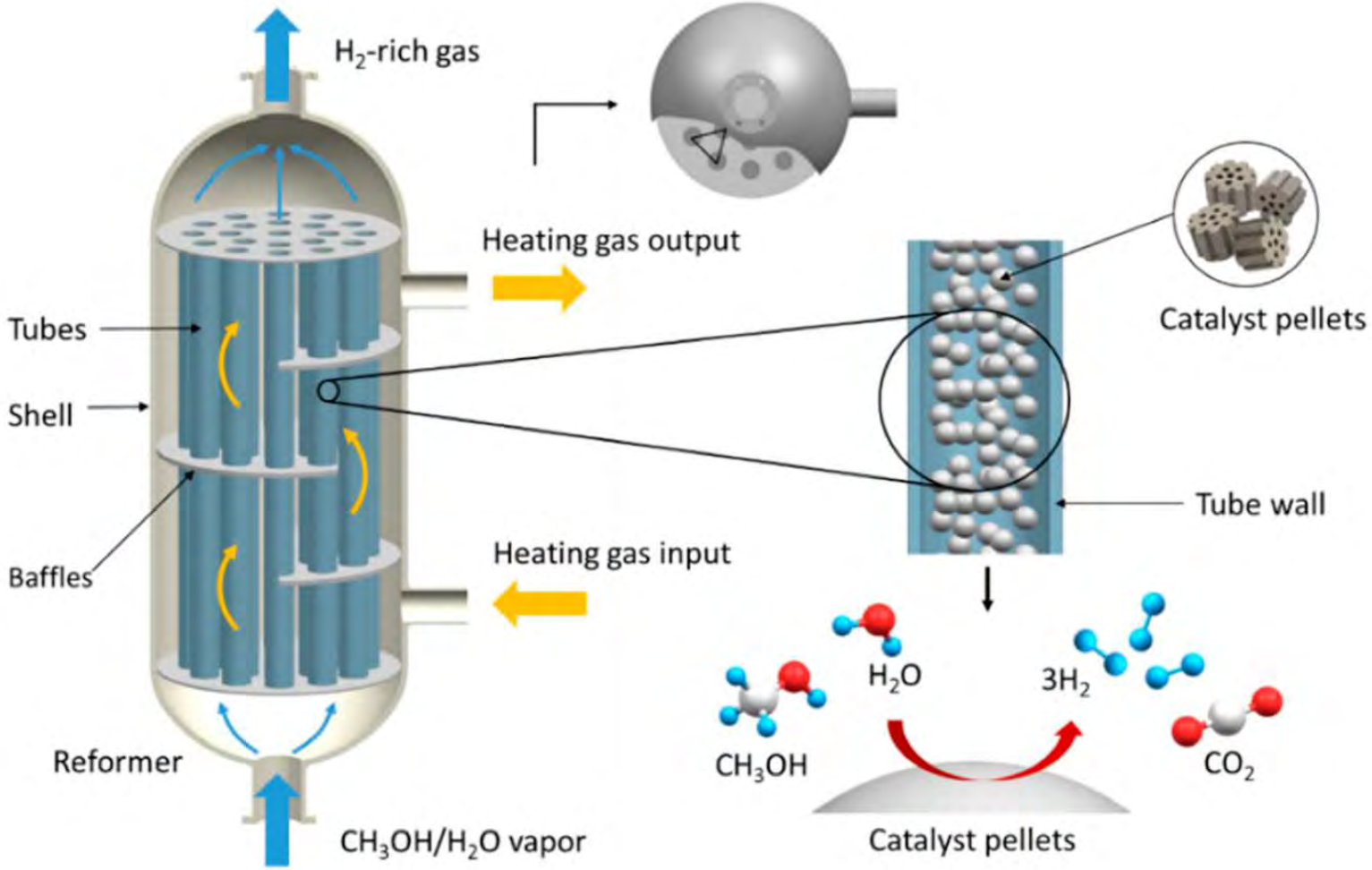
- **Process intensification (PI)** in chemistry involves redesigning chemical processes to be significantly smaller, cleaner, and more efficient, often achieving order-of-magnitude improvements in energy consumption, sustainability, and cost.
- **Selectivity** is usually defined as the fraction, either molar or mass, clearly stated, of desirable product formed by the reaction
- **SMR (Steam Methan Reforming) :** Steam reforming or steam methane reforming (SMR) is a method for producing syngas (hydrogen and carbon monoxide) by reaction of hydrocarbons (natural gas) with water. Reaction is endothermic and requires temperatures of 800C to 900C at 20-30 Barg.

$$\mathrm{CH_4 + H_2O \rightleftharpoons CO + 3\,H_2}$$

- **FT (Fischer Tropsch):** The Fischer–Tropsch process (FT) is a collection of chemical reactions that converts a mixture of carbon monoxide and hydrogen, known as syngas, into liquid hydrocarbons. Reaction is exothermic and requires temperatures of 150C to 300C at 25 Barg.

$$(2n + 1)\,\mathrm{H_2} + n\,\mathrm{CO} \rightarrow \mathrm{C}_n\mathrm{H}_{2n+2} + n\,\mathrm{H_2O}$$

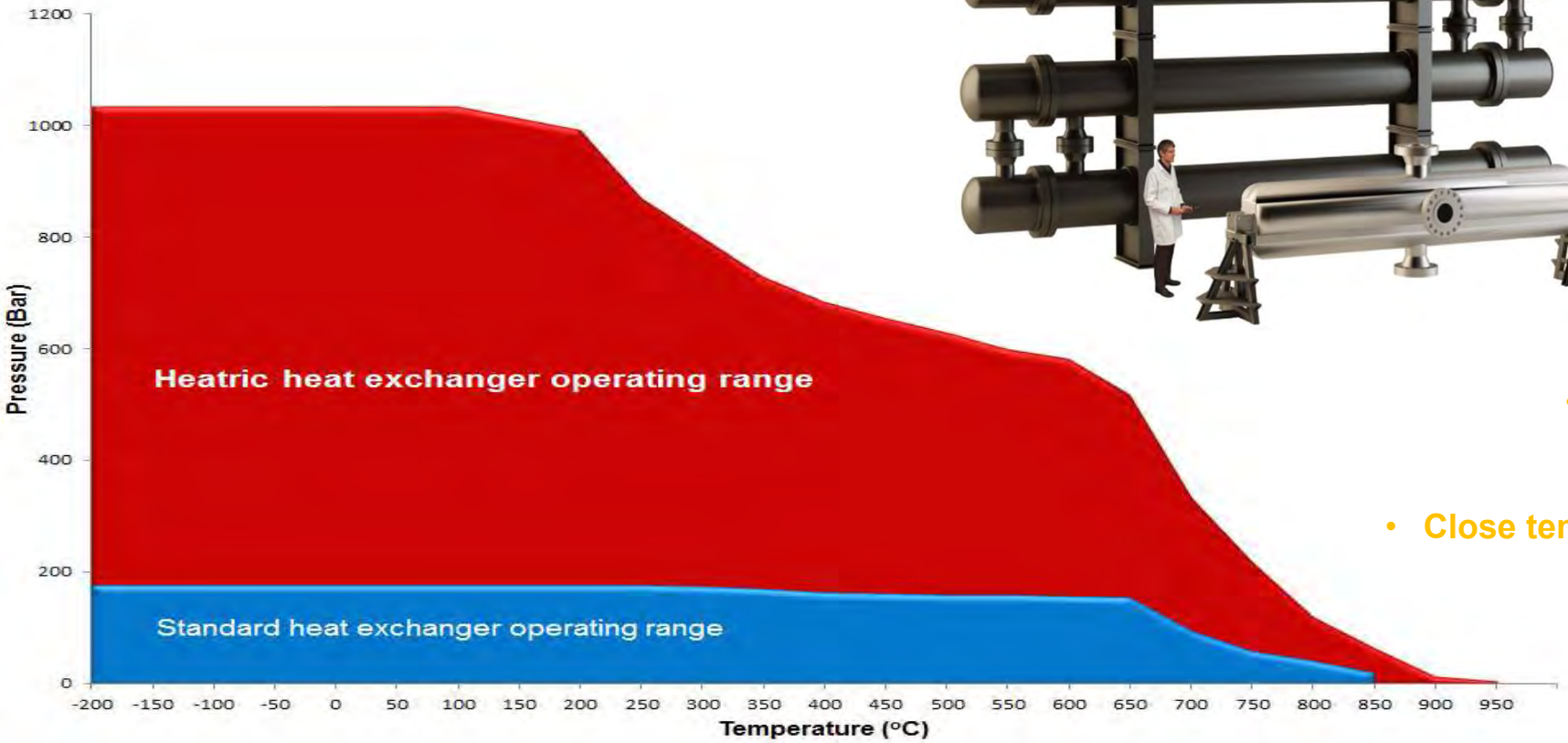
Tubular Reactors



Tubular Reactors – Pearl GTL

- **Pearl GTL FT Reactors in numbers:**
  - 24 Reactors, each:
    - 1,200 tons
    - 7 m diameter
    - 13 m tall
    - 29,000 tubes

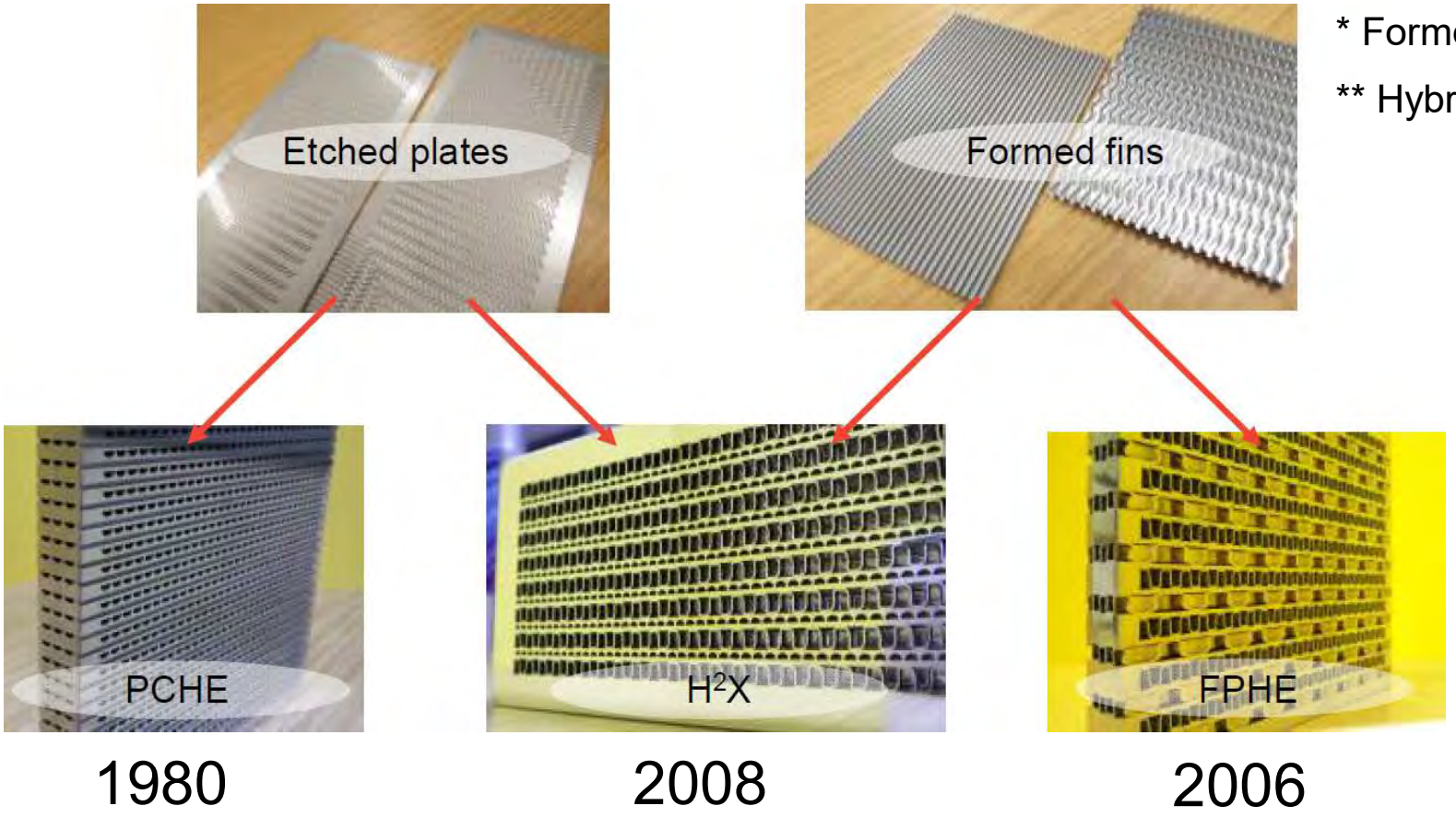
Printed Circuit Reactor (PCR)



- Compactness
- Integrity
- Low inventory
- High pressure & temp
- Corrosion resistance
- Close temperature control (>2°C)
- Catalyst inserts
- Retrofit options

Heatric products - Heatric PCHE, FPHE*, H²X**

Current and past

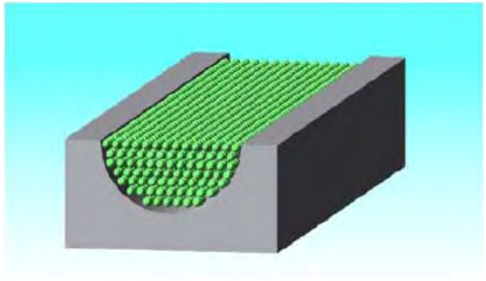


* Formed Plate Heat Exchanger

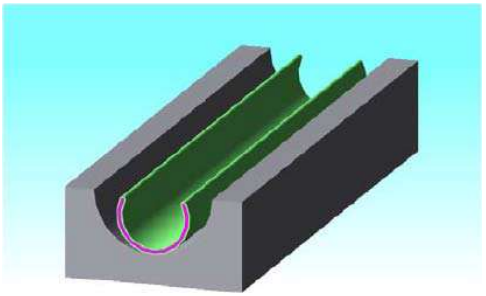
** Hybrid Heat Exchanger

Process Intensification

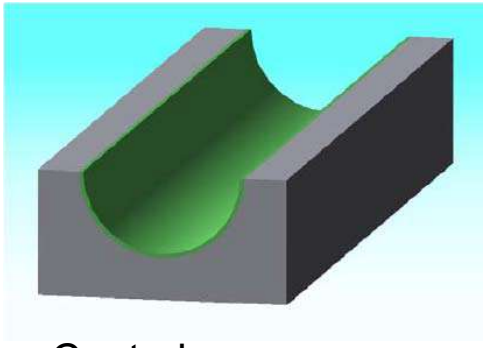
Catalysts



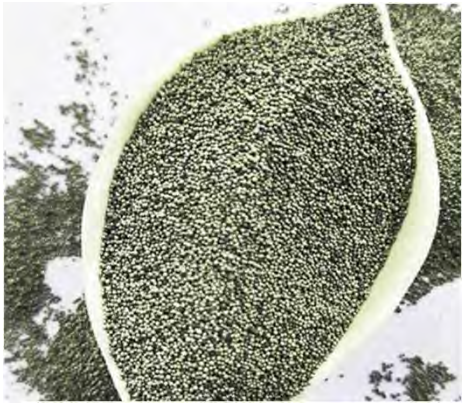
Packed passages



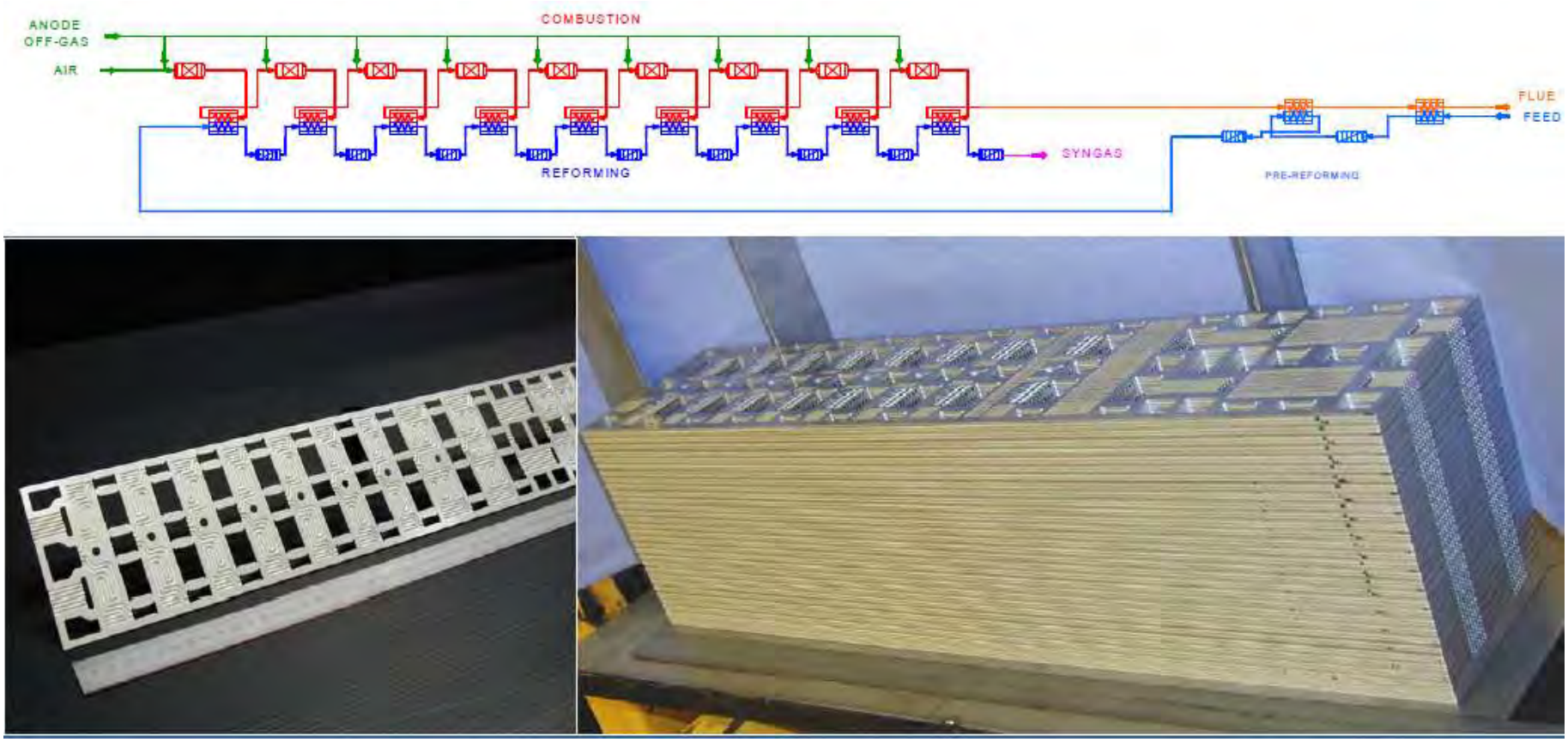
Catalyst inserts



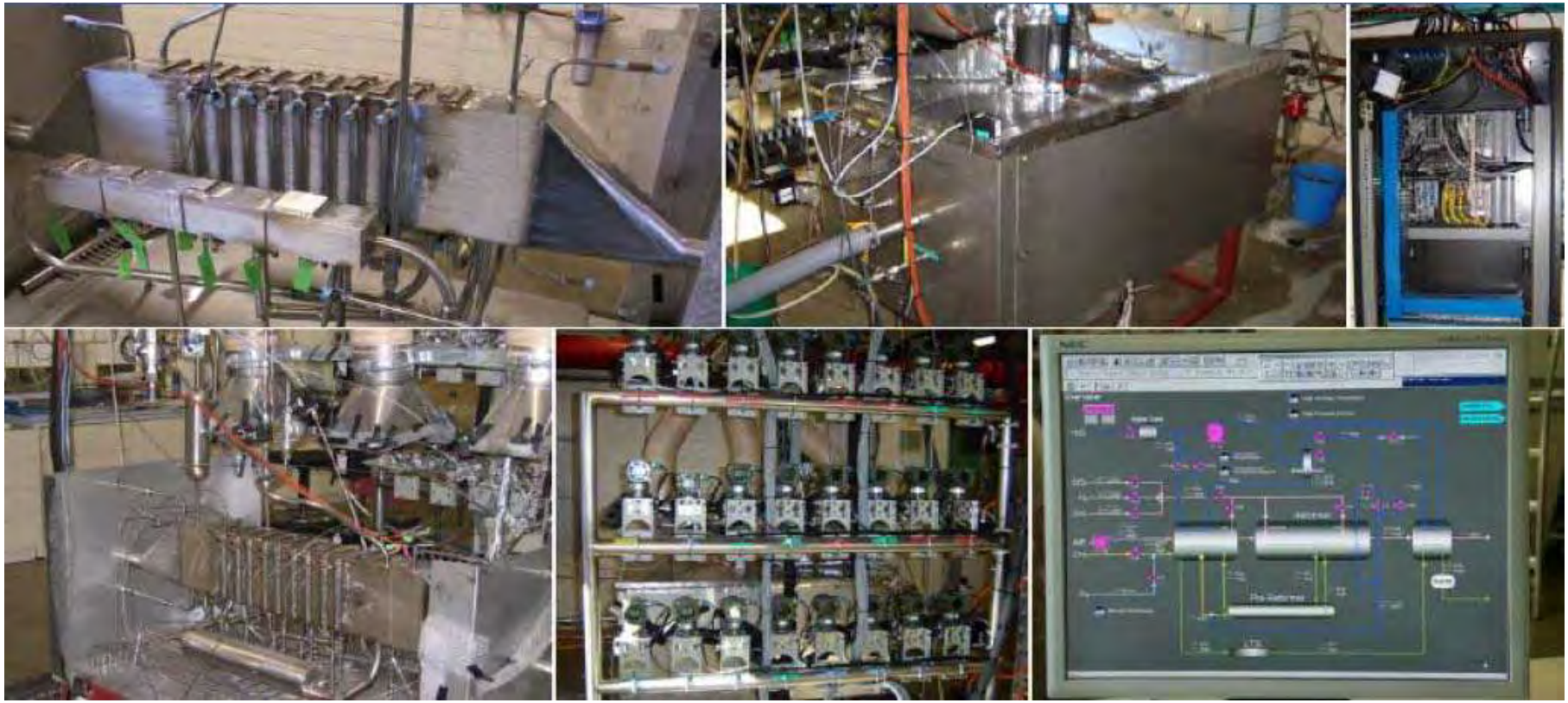
Coated passages



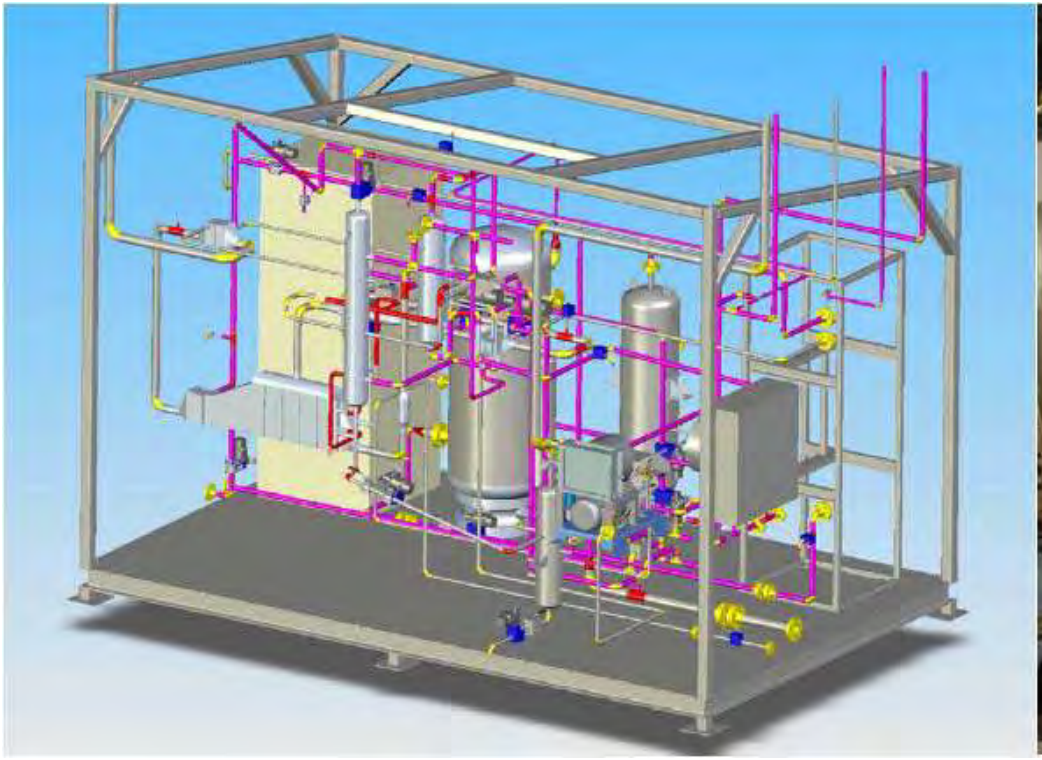
Printed Circuit Reactor – Multiple Adiabatic Beds



Testing Facility



Steam Reformer – Industrial prototype



BASF Geismar Ethylene Oxyde Lean/Rich Exchanger

Heatric