Heat exchangers
design & manufacturing

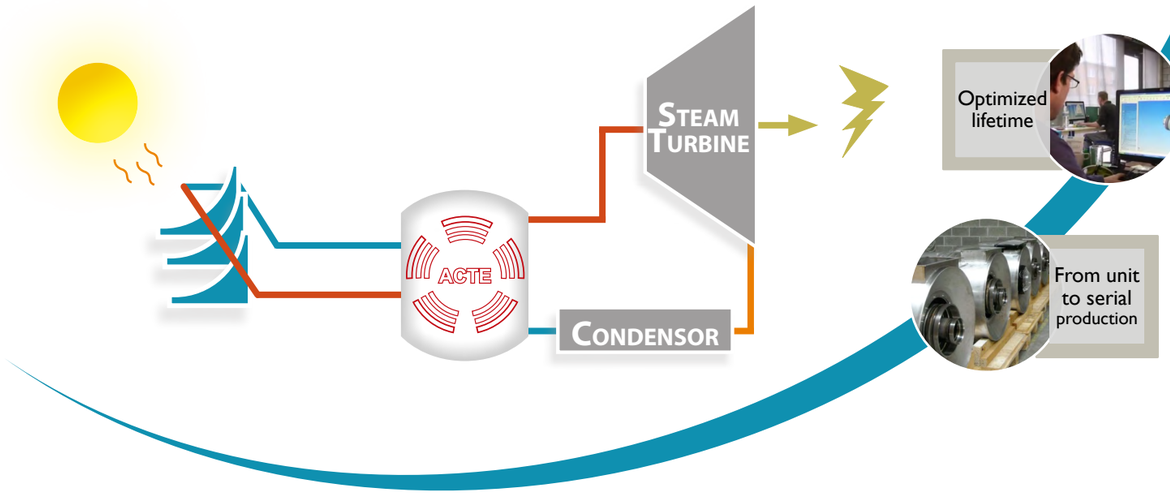
Energy

Some Applications needing compact heat recuperators in the field of Power Generation

Solar Power Generation and ORC Applications

Université de Liège

www.ulg.ac.be | The University of Liège is very active in trans european R&D projects such as Marshall Plan and H2020. Among these numerous projects, ACTE has been required to design and manufacture an oil-to-vapor heat exchanger for a solar-ORC application. The steam generator is aimed at feeding a steam turbine to eventually generate power thanks to solar energy. This project started in 2014 and is still running.



CHP and Micro Gas Turbines applications

www.rmv-tech.com | RMV tech Oy develops and manufactures compact plug-and-play CHP units. ACTE has been requested to provide a solution able to increase the 30 kW gas turbine efficiency while offering a compact and easy-to-maintain heat recuperator. While the overall system testing program is ongoing, the company says “test runs give confidence that set targets will be met in terms of maximum power, volume and fuel consumtpion(depending on application)”.

Business Case | Gas Turbine CHP units

OVERVIEW

Date | 2015

Sector | Energy supply

Challenge | Optimize the gas turbine effectiveness

Solution | COMPACT 55-7-0

The customer is a manufacturer of 18kW CHP units working with gas turbines. The unit is designed for remote power supply of housing estates, hospitals, office buildings, shopping centers, oil and gas companies.

In micro-gas turbine more than any other field, effectiveness is a key factor of success. The higher the gas turbine efficiency, the lower the fuel consumption and the more attractive the solution.

The idea was simple: use the waste heat from the micro-gas turbine exhaust gas to pre-heat the combustion air and increase the gas turbine efficiency (recovered Brayton Cycle).

Operating Conditions and constraints

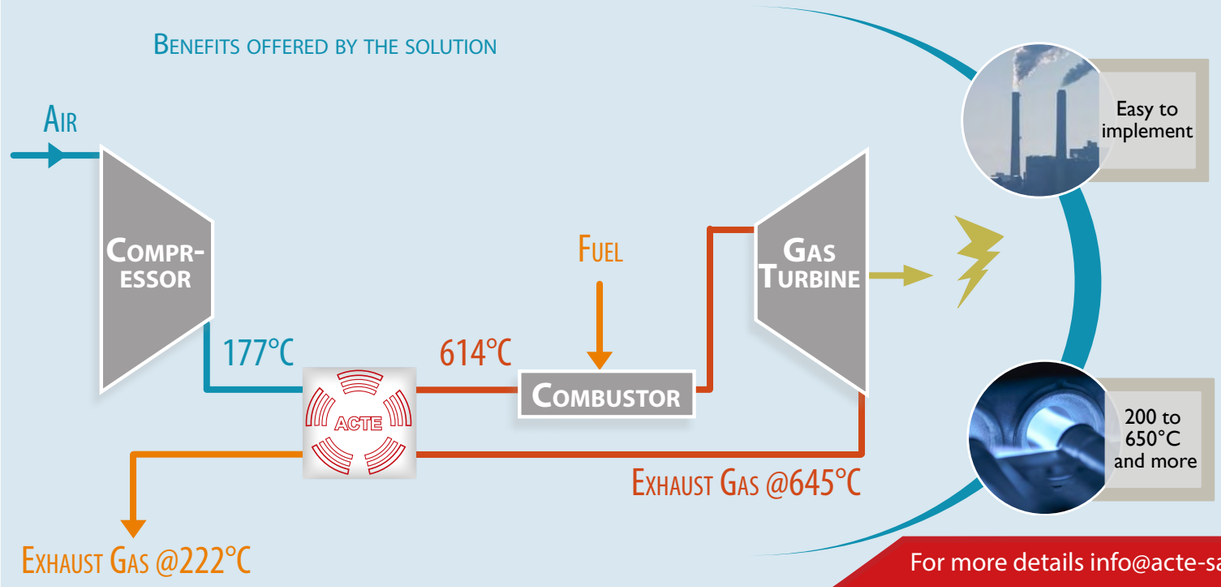
Hot side - entry data		Cold side - entry data	
Exhaust gas temperature	645°C	Air inlet temperature	177°C
Exhaust gas mass flow	0.24 kg/s	Air mass flow	0.24 kg/s
Exhaust gas working pressure	1,04 bar (a)	Air working pressure	2.88 bar(a)
Exhaust gas pressure drop	<5 mbar	Air allowable pressure drop	14 mbar

In this project, the most critical constraints were:

- Achieving a high effectiveness ratio
- Making the integration easy within the CHP unit
- Respecting the turbine back-pressure constraint (low pressure drops)

Computed performances - outlets			
Gas temperature	222°C	Gas pressure drop	2.4 mbar
Air temperature	614 °C	Air pressure drop	8.6 mbar
Effectiveness	92%	Total pressure drop	5.3 %

Benefits offered by the solution



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