

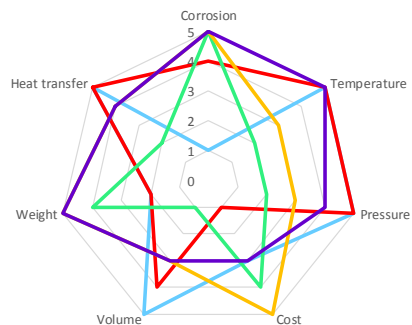
Alternative materials for heat exchangers

Corrosion and fouling resistance and scarcity of materials are two important challenges in the enormous heat exchanger market, estimated at about 500.000 tons per year in the EU alone. The market is even expected to grow at 4.7% in the coming years.

Polymers and polymer compounds are an alternative material to metals and special alloys in particular that are known to be more corrosion resistant. The approach of polymer or composite heat exchangers could bring added value in many applications such as HVAC systems, solar boilers, waste heat recovery applications, bottom cycling, etc. Furthermore, heat exchangers based on this type of materials promise to weigh less and be cheaper.

We will mainly look at (the cheaper) thermoplastic materials and evaluate their usage in applications where today costly special alloys are used.

— Traditional metals — Specialty metals — Current HEX polymer based
— Targeted SBO results — HEX based on thermosets



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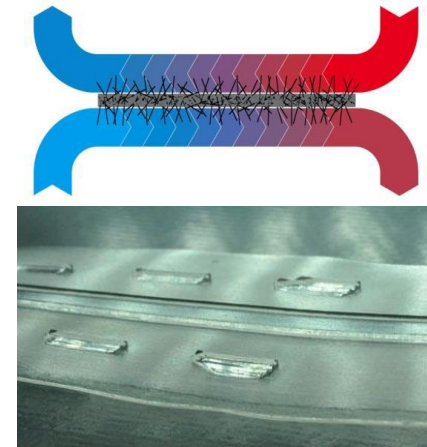
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Composite Heat Exchangers

Consortium

The research partners involved in the COMPOHEX project are all part of Ghent University:

- Thermohydraulic expertise is delivered by the Department of Flow, Heat and Combustion Mechanics, Applied Thermodynamics and Heat Transfer research group, prof. De Paepe
- Materials degradation and performance modelling is brought in via the Department of Material Science and Engineering, Mechanics or Materials and Structures research group, prof. Van Paepegem
- Polymer processing and production is available via the Department of Material Science and Engineering, Center for Polymer and Material Technologies, prof. Cardon

The project is furthermore supported by:

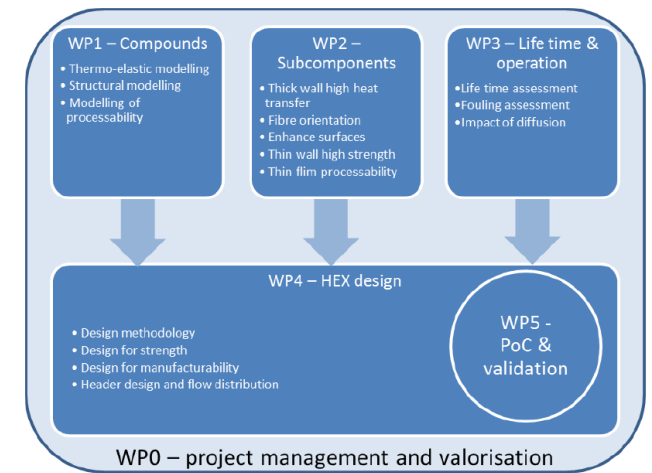
- The business development clusters Composites (materials) and SET (Sustainable Energy Technologies)
- Power-Link project management and dissemination partner



Research objectives

COMPOHEX is a research project aiming at developing new **applications for composite heat exchangers**. Though composite heat exchanger do exist on the market, but present solutions do not fully cope with the pressure and temperature levels observed in the most promising applications. *Five important challenges will be tackled:*

- **improving designs** for Low Temperature, Low Pressure polymer heat exchangers [6bar, 90°C];
- **increasing life time & lower cost** for high temperature low pressure polymer heat exchangers. [up to 250°C, 1bar];
- **developing new concepts for higher pressure** low temperature polymer heat exchangers [up to 30bar, 60°C];
- **exploring the pressure and temperature boundary limits** of high pressure, high Temperature polymer heat exchangers [>10bar, >150°C];
- **validating integrated design methods**.



Industrial partners

To ensure the industrial applicability and feasibility of the research activities and the project results, the team has assembled an industrial advisory group comprising of industrial stakeholders spread along the ‘future’ value chain for composite heat exchangers.

The figure below presents this list of Flemish companies and their interest in the project.

MAT. & COMPOUNDS	MANUF. OF SUBCOM. + MACHINERY	HEX MANUF. + HEX DESIGN	INTEGRATOR + HEX MANUF. & DESIGN	END Users
 better together	 	 	 WE EXCEL UNDER PRESSURE. Solutions for a Cleaner Future THE HEATING COMPANY 	 vision on technology