



HEAT  
EXCHANGE  
MASTERY

MADE IN ITALY SINCE 1951 ● ○ ●



## FIC condensation systems for heat-recovery

All industrial processes use energy and some of them are really heavy consumer of it. Pulp&Paper is one of these and **the energy saving has been always a focus for every plant manager, to run the plant in a profitable and efficient way.** This target has been becoming more and more important during the years in consideration of the struggle to reduce the fossil source consumption linked also to the environmental safeguard. In the Paper production there is **a lot of humid air that has high energy content:** being capable to recover it or part of it would be highly beneficial for the whole process, in fact it could be used to pre-heat the fresh air used for the drying.

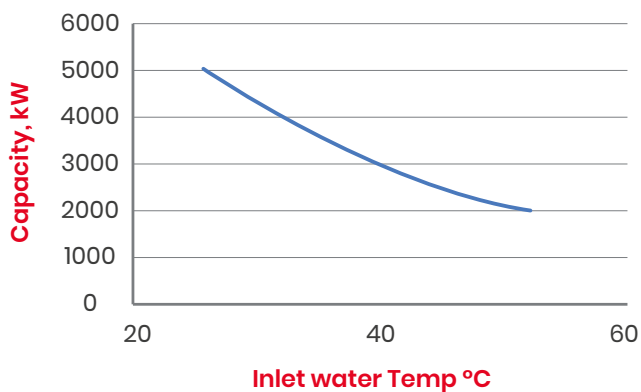
### FIC TECHNOLOGIES FOR HEAT-RECOVERY AND HEAT-TRANSFER

How to do this? Heat-recovery is achieved with heat-exchangers of different type, but according to the selected type, the recovery efficiency can be more or less high.

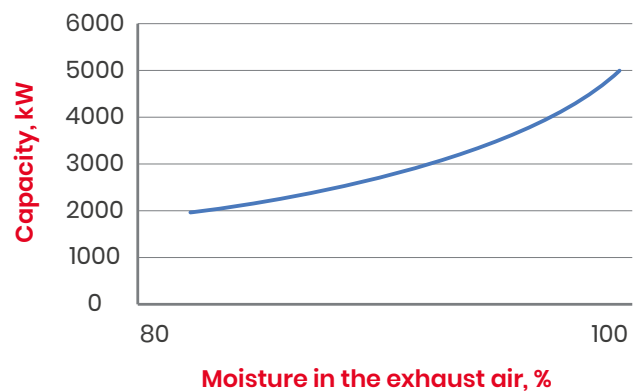
FIC/Sical has developed technologies and know-how to design such kind of equipment for both air/water or air/air application: they used thermal plates as heat-transfer surface

These technologies are based on a scientific approach, studying the process on lab scale, that allowed to define the right mathematical model to simulate it, further proving its reliability running pilot test and finally going to the industrial scale with the first experiences, early in the 90's. **The result has been fully in compliance with the expectations showing high efficiency.**

#### AIR/WATER FIC HEAT EXCHANGERS HOW WATER TEMPERATURE AFFECTS THE CAPACITY



#### AIR/WATER FIC HEAT EXCHANGERS INCREASE OF CAPACITY VS. MOISTURE CONTENT IN THE EXHAUST AIR



■ Heat recovered

## ADVANTAGES OF FIC CONDENSATION SYSTEMS FOR HEAT RECOVERY

- High turbulence, meaning high heat-transfer ratio
- Surface working 100% without hidden or blinded zones
- Perfect condensate film formation, thus enhancing the heat-transfer and getting high efficiency
- Low pressure drops
- Flexibility in design: possibility to adapt to wide range of process conditions
- Cleanability: the plates are always kept clean, thus fouling or sticking of material is avoided in principle.

## USE OF THE RECOVERED ENERGY

- Process water
- White water
- Glycole water



## FIC HEAT-EXCHANGE MASTERY

**FIC is a master producer of thermal plates** and heat-exchangers, with 4 automatized welding lines.

The design and construction of the heat-exchangers follows the strictest international design codes for pressure vessels like CE/PED and U-Stamp and all welding processes are qualified according to ISO 3834. FIC/Sical heat-exchangers are manufactured stainless or duplex steel like AISI 316L, 304, SAF2205 and other alloys upon request.

**FIC/Sical heat exchangers are used in hundreds of paper mill around the globe, with total heat-recovered of more than 600 MW.**

## PLANT LAYOUT

