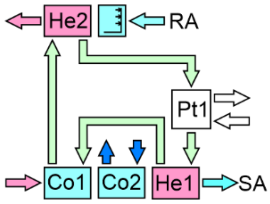
Air cooler calculation

In many industrial processes, you are dependent on dry air, otherwise the products to be manufactured, such as medicines, absorb moisture and become unusable. If a lot of moisture has to be removed from the air, part of the output can be achieved via cold recovery, provided that the exhaust air is pre-cooled adiabatic.

CCSF dehumidification system

A large proportion of cooling capacity and dehumidification must be cooled with cold water via the finned air cooler (Co2). For a long time, this system was in the foreground, with the finned air cooler (Co2) causing high air-side pressure drops throughout the year, i.e. even when it is not in operation. This leads to additional operating costs, because the supply air fan has to do more. It is also important to note, that effective condensate separation must take place after the aftercooler (Co2), otherwise the condensate will enter the reheater.

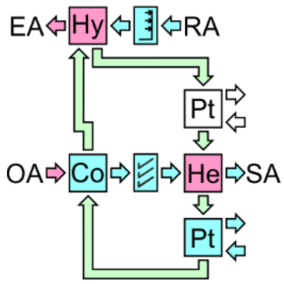
Software CCSF Split



CCSH dehumidification system

Recently, instead of a finned aftercooler (Co2), a plate heat exchanger (Pt) has been integrated into the glycol circuit, which is operated with cold water. In this way, the operating costs of the supply air fan can be significantly reduced. However, another problem arises in, that not all manufacturers of finned heat exchangers can show a type examination, for example by the TUEV Süd in Munich, and have no idea, how to calculate a cooler with a high proportion of latent power. On the other hand, thanks to a totally useless calculation, you are very cheap.

Software CCSH Split



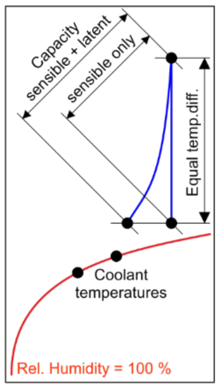
Cooling course

Counterflow in finned heat exchangers exists only in the imagination of producers with insufficient thermodynamic training.

Apparently, these producers of finned heat exchangers are not interested in whether the performance is achieved.

Only those, who calculate the cooling process with at least 15 finite elements in the direction of air, will produce correct results.

Cooling course



Mean logarithmic temperature difference

The exponential temperature gradients do not apply, since only sensitive power is dissipated at the beginning and latent power only later.

The temperature curve changes and can tend towards zero at the narrowest point, the so-called pinch point.

The effective Δtm can be understood as the area between the two temperature curves and is extremely reduced, which has been confirmed by measurements in the laboratory.

Conclusion: Latent power reduces the mean logarithmic temperature difference enormously and requires larger heat exchangers!

Δtm reduced