MANCHESTER 1824
The University of Manchester

COLPROF Overview

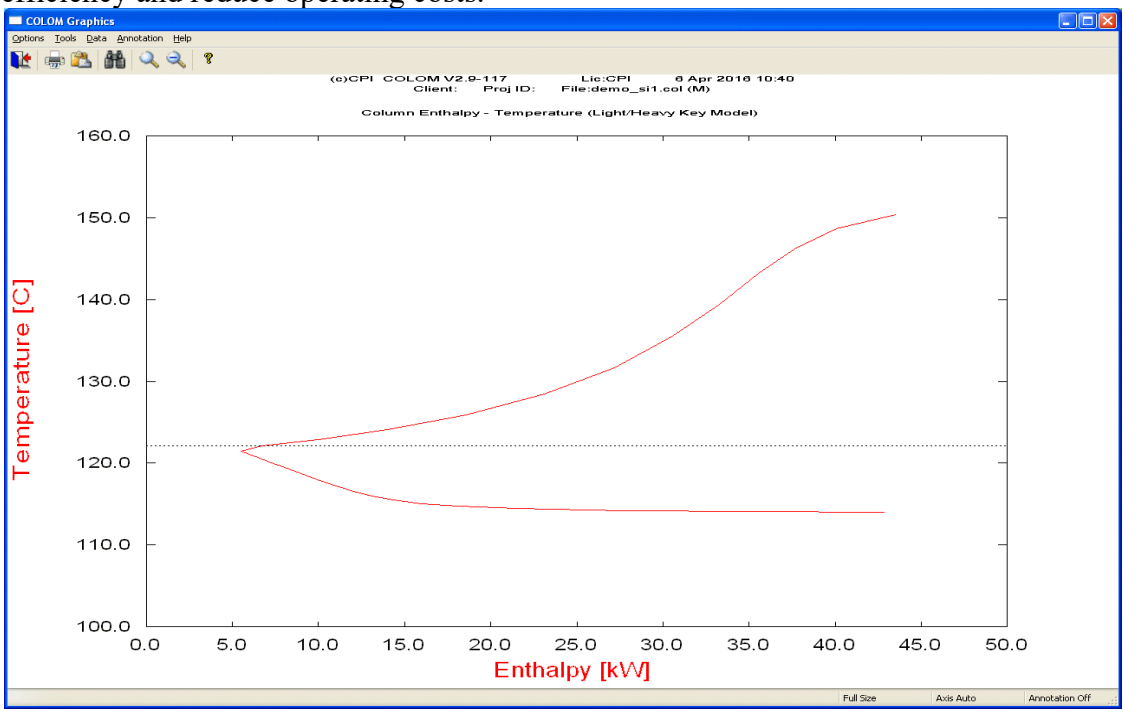
COLPROF is a software package for analysing the thermodynamic efficiency and hydraulic performance of individual distillation columns. It uses temperature-enthalpy and temperature-exergy profiles to identify opportunities for improving feed conditions, adding inter-reboiling or inter-condensing, and reducing operating costs. It also supports hydraulic analysis to identify bottlenecks and assess options for increasing column capacity.

COLPROF can be used to address the following distillation-column analysis and retrofit tasks:

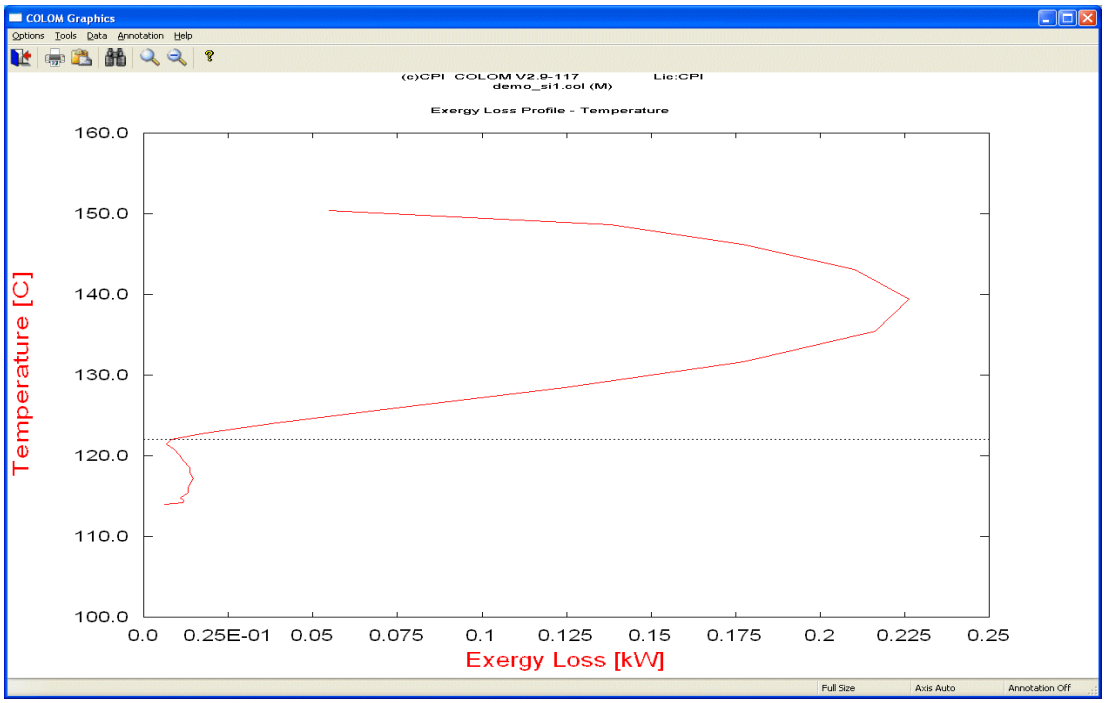
- Generation of temperature-enthalpy profiles.
- Generation of temperature-exergy profiles.
- Retrofit for increased throughput.

Enthalpy and Exergy Profiles

COLPROF can generate temperature-enthalpy profiles for a distillation column to assess the potential for inter-reboiling and inter-condensing. It provides two methods. The first uses results from a column simulation to generate a reversible column profile. The second generates a column profile that includes minimum heat- and mass-transfer driving forces. The exergy-loss profile shows the distribution of driving forces in the column and helps identify modifications such as feed conditioning and side reboiling or condensing. These modifications can improve the column's thermodynamic efficiency and reduce operating costs.



Temperature – Enthalpy profile for a column



Temperature –Exergy profile for a column

Retrofitting for Increased Throughput

Distillation columns are often the bottleneck when a process requires increased throughput. **COLPROF** includes hydraulic analysis to identify the location and cause of column bottlenecks, allowing retrofit options to be evaluated before process capacity is increased.

