ដែលម៉ូស៊ីស្រាស៊ីកាលអាស៊ីសម្លាស់ អាសាសមាល់ អាស្រាស្រាស្រាស្រីស្រីស្រីស្រាស់ ស្រីស្រីស្រាស់ ស្រីស្រាស់ ស្រីស្រាស់

##C625619 :MAJOR CHEMICAL TECHNOLOGY
KEYWORD: EXPERT SYSTEM / HEAT EXCHANGER / DESIGN
CHARNWEJ MUNINNIMITT : EXPERT SYSTEM FOR HEAT EXCHANGER
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An expert system for selecting a heat exchanger and design was developed. The program composes of three parts: (1) the selection part, (2) the design part, and (3) the database of fluid properties. In the selection part, the heat exchanger selection program was developed using knowledge-based of criteria that was collected from the experts. The popular types of heat exchangers in the industry selected are; Air-Cooled, Plate-and-Frame, Spiral, Double-Pipe, and Shell-and-Tube. Before starting selection process, the program started from checking phase of the fluids and calculating an unknown temperature and heat load. The selection proceeded by excluding the ones that did not comply with criteria and decided based on these criteria by using SMART method (Simple Multi Attribute Rating Technique). The results display the reason of selecting and/or excluding each heat exchanger, heat exchange area, suitable material, and rough cost estimation.

In the design part, Shell-and-Tube heat exchanger design program optimizes the solution based on the economic aspect. The result is reliable for the case of liquid and liquid exchange. The friction factor is the most critical factor for the overall heat transfer coefficient calculation. The ratio of change of the overall heat transfer coefficient to unit of friction factor is about 11,326:1. And the last part, the database section contains the properties of 33 chemical species. The properties are density, viscosity, heat capacity, thermal conductivity, critical temperature, and critical pressure. The program allows a user to modify or add new data into the database.

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