Cross-flow coefficient and energy storage coefficient

How do cross-flow heat exchangers increase heat transfer rate?
The development of the cross-flow heat exchangers for increased heat transfer rate is achieved by finning the tubes of different tube geometry and pitch ratios. The latest development is the use of the vortex generators or winglets so as to increase the fluid turbulence.

What is a mathematical model for cross-flow heat exchangers with complex flow arrangements?
In this paper a mathematical model for cross-flow heat exchangers with complex flow arrangements for determining e -NTU relations is presented. The model is based on the tube element approach, according to which the heat exchanger outlet temperatures are obtained by discretizing the coil along the tube fluid path.

What is a cross-flow heat exchanger?
This heat transfer areais an area of the exchanger that is in direct contact with fluids and through which heat or energy is transferred. Figure 1 shows the cross-flow heat exchanger. The exchanger contains alternate corrugated plates arranged in a cross-flow manner.

What are the pumping losses in a cross-flow heat exchanger?
The pumping losses are the inherent partof the cross-flow heat exchanger,which can be minimized to a certain extent but cannot be eliminated completely. Further with large array size,and staggered layout of the tube bank pumping power increases even further.

Can a cross-flow heat exchanger be used under low Reynolds number?
In this study, the theoretical and experimental study of a cross-flow heat exchanger is carried out based on the theory of porous media under low Reynolds number. The accuracy of the mathematical calculation model is verified by experi- ments.

How to choose a cross-flow heat exchanger with a fin and vortex generator?
The pressure drop is bound to be high for different fin and vortex generators, but in such case increase in the heat transfer rate is a critical aspect of comparison. Such a study on cost estimation will form the basis in the selection of cross-flow heat exchanger with suitable tube geometry, fin, and vortex generator.

exchanger flow oCorrelations covered in Lectures 3 and 5 can be used for calculating heat transfer coefficient and pressure drop or

Heat transfer processes set limits to the performance of aerospace components and systems and the subject is one of an enormous range of application. The notes are intended to describe the three types of heat transfer and provide basic tools to enable the readers to estimate the magnitude of heat transfer rates in realistic aerospace applications.

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We computationally model the flow over groups of offshore energy storage balloons. o Long, precessing vortex tubes are shed downstream from the balloons. o Total drag coefficient of the closed case is less than that of the wide case. o Total drag of floral configuration is smaller than 3 times drag of single balloon. o The LES was more capable of simulating the ...

The main thermophysical characteristic of heat exchangers is the global coefficient, UA. This characteristic allows us to quantify the amount of heat transferred from medium 1 to medium 2 at a ...

In this paper a mathematical model for cross-flow heat exchangers with complex flow arrangements for determining e -NTU relations is presented. The model is based on the ...

Abstract: This paper presents heat transfer and effectiveness analysis based on a physical model of a cross-flow heat exchanger. Using the model, the transferred heat and effectiveness (?) in terms of temperature and NTU-method are calculated for both hot and cold streams.

Currently, the evaluation of valve flow coefficient is often performed by theoretical estimation or experimental measurement. Theoretical estimation cannot reflect the influence of detailed valve structure, and thus often results in poor accuracy. 1,2 Experimental measurement requires significant costs in time and equipment. 2,3 Especially for some valves ...

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