

Contents

1	Introduction	1
1.1	A Concise Literature Survey	1
1.2	The Development of the HETE Code	4
	References	5
2	Theoretical Development	9
2.1	Fundamentals of the ϵ -NTU Method	9
2.2	Differential Governing Equations	14
2.3	Finite Elements Governing Equations of the HETE Code	18
	References	20
3	Computational Procedure	23
3.1	Numerical Procedure of the HETE Code	23
3.1.1	Reading the Configuration Input Data	25
3.1.2	Thermal Input Data	27
3.1.3	Algorithm for Computing the Heat Exchanger Effectiveness ϵ	27
3.2	Examples Solved with the EES Software	35
	References	40
4	Numerical Results and Discussions	41
4.1	Model Tests and Validations	42
4.1.1	Cross-Flow Heat Exchangers with More Complex Configurations	54
	References	62
5	Computational Code HETE (Standard C Programming Language)	63
6	Input Data Files for Simulating with the HETE Code	69
7	Heat Exchanger Effectiveness Data for Several Configurations	77

8	EES Programs	219
8.1	First EES Program: “One_pass_one_row_cross_flow.EES”	219
8.2	Second EES Program: “One_pass_two_rows_cross_flow.EES”	221
8.3	Third EES Program: “One_pass_three_rows_cross_flow.EES”	222
8.4	Fourth EES Program: “Two_pass_parallel_cross_flow.EES”	224
8.5	Fifth EES Program: “Two_pass_counter_cross_flow.EES”	225

Thermal Performance Modeling of Cross-Flow Heat
Exchangers

Cabezas-Gomez, L.; Navarro, H.A.; Saíz-Jabardo, J.M.

2015, XII, 226 p. 106 illus., Softcover

ISBN: 978-3-319-09670-4