

# Contents

<b>1</b>	<b>Introduction to Computation</b>	<b>1</b>
1.1	General Considerations	1
1.2	Mean Isobaric Specific Heat	3
1.2.1	Water and Superheated Steam	4
1.2.2	Air and Other Gases	4
<b>2</b>	<b>Design Computation</b>	<b>7</b>
2.1	Introduction	7
2.2	Fluids in Parallel Flow or in Counter Flow	8
2.3	The Mean Difference in Temperature in Reality	12
2.3.1	Fluids in Cross Flow	14
2.3.2	Heat Exchangers	15
2.3.3	Coils	19
2.3.4	Tube Banks with Various Passages of the External Fluid	21
<b>3</b>	<b>Verification Computation</b>	<b>25</b>
3.1	Introduction	25
3.2	Fluids in Parallel Flow or in Counter Flow	25
3.3	Factor $\psi$ in Real Cases	33
3.3.1	Fluids with Cross Flow	33
3.3.2	Heat Exchangers	34
3.3.3	Coils	35
3.3.4	Tube Bank with Various Passages of the External Fluid	37
<b>Appendix A</b>	<b>Corrective Factors for Design Computation</b>	<b>39</b>
A.1	Fluids in Cross Flow	39
A.2	Heat Exchangers	42
A.2.1	Heat Exchangers with 2 Passages of Internal Fluid (Fig. 2.5)	42
A.2.2	Heat Exchangers with 3 Passages of Internal Fluid (Fig. 2.6)	58
A.2.3	Heat Exchangers with 4 Passages of Internal Fluid (Fig. 2.7)	74
A.3	Coils	84

A.3.1	Coils with Fluids in Parallel Flow (Fig. 2.8) . . . . .	84
A.3.2	Coils with Fluids in Counter Flow (Fig. 2.9) . . . . .	90
A.4	Tube Banks with Several Passages of External Fluid . . . . .	100
A.4.1	Tube Banks with Fluids in Parallel Flow (Fig. 2.10) . . . . .	100
A.4.2	Tube Banks with Fluids in Counter Flow (Fig. 2.11) . . . . .	104
<b>Appendix B Factor <math>\psi</math> or Corrective Factors for Verification</b>		
	<b>Computation . . . . .</b>	111
B.1	Fluids in Parallel Flow or Counter Flow . . . . .	112
B.2	Fluids in Cross Flow . . . . .	118
B.3	Heat Exchangers . . . . .	121
B.3.1	Heat Exchangers with Two Passages of Internal Fluid (Fig. 2.5) . . . . .	121
B.3.2	Heat Exchangers with Three Passages of Internal Fluid (Fig. 2.6) . . . . .	137
B.3.3	Heat Exchangers with Four Passages of Internal Fluid (Fig. 2.7) . . . . .	153
B.4	Coils . . . . .	163
B.4.1	Coils with Fluids in Parallel Flow (Fig. 2.8) . . . . .	163
B.4.2	Coils with Fluids in Counter Flow (Fig. 2.9) . . . . .	165
B.5	Tube Banks with Several Passages of External Fluid . . . . .	170
B.5.1	Tube Banks with Fluids in Parallel Flow (Fig. 2.10) . . . . .	170
B.5.2	Tube Banks with Fluids in Counter Flow (Fig. 2.11) . . . . .	173