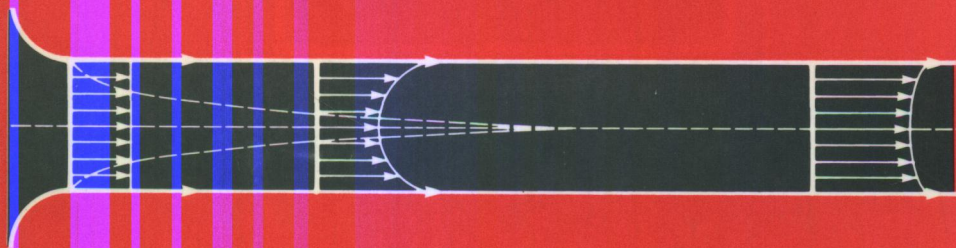


Third Edition

Convective Heat and Mass Transfer



W. M. Kays
M. E. Crawford

CONTENTS

Preface to the Third Edition	xi
Preface to the Second Edition	xv
Preface to the First Edition	xix
List of Symbols	xxii
Units Conversion Table	xxxiii
1 Introduction	1
2 Conservation Principles	5
3 Fluid Stresses and Flux Laws	10
4 The Differential Equations of the Laminar Boundary Layer	19
5 The Differential Equations of the Turbulent Boundary Layer	44
6 The Integral Equations of the Boundary Layer	62
7 Momentum Transfer: Laminar Flow inside Tubes	75
8 Momentum Transfer: The Laminar External Boundary Layer	88
9 Heat Transfer: Laminar Flow inside Tubes	108
10 Heat Transfer: The Laminar External Boundary Layer	159
11 Momentum Transfer: The Turbulent Boundary Layer	192
12 Momentum Transfer: Turbulent Flow in Tubes	244
13 Heat Transfer: The Turbulent Boundary Layer	255
14 Heat Transfer: Turbulent Flow inside Tubes	311
15 The Influence of Temperature-Dependent Fluid Properties	355
16 Convective Heat Transfer at High Velocities	370
17 Free-Convection Boundary Layers	396
18 Heat-Exchanger Analysis and Design	417
19 Compact Heat-Exchanger Surfaces	443
20 Mass Transfer: Formulation of a Simplified Theory	480
21 Mass Transfer: Some Solutions to the Conserved-Property Equation	503

22	Mass Transfer: Some Examples of Evaluation of the Driving Force	517
	Appendixes	541
	A Property Values	541
	B Dimensions and Conversion to SI	559
	C Some Tables of Functions Useful in Boundary-Layer Analysis	563
	D Operations Implied by the ∇ Operator	566
	E Turbulent Boundary-Layer Benchmark Data	570
	Indexes	
	Author Index	591
	Subject Index	595