## Contents

Word	finder index	V11
1	Mixing technology	1
1.1	An historical overview of powder mixing science and technology	1
1.2	A holistic approach to powder mixing	11
1.3	Mixers and powder mixing mechanisms	19
1.4	What is an ideal mixture? Techniques for describing the structure	35
15	Of mixture Graphical and experimental description of mixture structure	63
1.5	Graphical and experimental description of mixture surdeure	05
2	Powder and powder mixture characterization technology	77
2.1	Sampling a powder mixture	77
2.2	Techniques for characterizing the grain sizes of a powder	81
2.3	Quantitative description of the shape of powder grains	83
2.4	Fingerprinting powder mixtures using an aerosol spectrometer	96
2.5	Characterizing a powder mixture by its permeability	100
3	Powder rheology	106
3.1	A new angle on powder flow characterization	106
3.2	Using flowagents: a Faustian bargain?	111
3.3	Settling down in a vibrated bed	113
3.4	Characterizing the flow behavior of a powder by studying	
	avalanching behavior	124
4	Can ingredient modification expedite mixing strategies?	132
4.1	Alternative ingredient strategies for solving powder mixing	
	problems	132
4.2	Modifying the size distribution of the powder ingredients	134
4.3	Microencapsulation of ingredients	140
4.4	Technologies for producing microcapsules	140
5	Monitoring mixers and mixtures	147
5.1	Distinguishing between chaos creating operations and dispersion	
	mechanisms	147

vi Contents

5.2	Poisson tracking as a technique for studying chaotic conditions in a powder mixer	148
5.3	Using radioactive tracers to follow powder dispersion in powder	140
	mixing equipment	155
5.4	Monitoring mixture structure by means of optical reflectance	
	measurements	157
5.5	Fingerprint sizing of powder mixtures to monitor the performance	
	of powder mixing equipment	173
5.6	Characterizing the structure of consolidated mixtures by optical	
	inspection	175
5.7	Auto- and cross-correlation of mixture structure	195
5.8	Infrared fingerprinting of powder mixtures	203
6	The impact of chaos theory and experimental mathematics	
	on powder mixing theory and practice	207
6.1	Introduction	207
6.2	Randomwalk models of powder mixing	209
7	Active mixing machines	218
7.1	Ribbon mixers	218
7.2	Tumbler mixers	224
7.3	High shear mixing and multimechanism mixers	229
8	Passive powder mixing systems	232
8.1	Baffled passive mixers	232
8.2	Gravity in-bin mixing devices	234
9	Turning powder mixtures into crumbs, pastes and slurries	243
9.1	From powder to paste	243
9.2	Dilatant and thixotropic suspensions	249
Auth	or index	259
Subject index		