

Contents

List of contributors	xi
Woodhead Publishing Series in Textiles	xiii
1 Introduction: the apparel industry	1
<i>R. Nayak, R. Padhye</i>	
1.1 Introduction	1
1.2 Global scenario of apparel manufacturing	4
1.3 Challenges in apparel production	10
1.4 Role of various organisations	12
1.5 Future trends	13
1.6 Conclusions	15
References	15
Part One Product development, production planning and selection of materials	19
2 Product development in the apparel industry	21
<i>M. Senanayake</i>	
2.1 Introduction	21
2.2 Product-development models and product-development process	22
2.3 Variations in apparel product development: demand-led product development	29
2.4 Apparel product-development technologies	32
2.5 Apparel product standards, specifications, quality assurance and product technical package.	33
2.6 Apparel product life-cycle management (PLM) and supply-chain relationships	41
2.7 Measures for apparel product development	43
2.8 Future trends in apparel product development	44
2.9 Case studies: PD tools and technologies	49
2.10 Conclusions	55
2.11 Sources of further information and advice	55
References	56

3	Role of fabric properties in the clothing-manufacturing process	59
	<i>B.K. Behera</i>	
3.1	Introduction	59
3.2	Fabric properties and performance	59
3.3	Garment make-up process and fabric properties	61
3.4	Low-stress mechanical properties and make-up process	63
3.5	Control system	67
3.6	Fabric tailorability, buckling and formability	69
3.7	Sewability	71
3.8	Conclusions	79
	References	80
4	Production planning in the apparel industry	81
	<i>S. Das, A. Patnaik</i>	
4.1	Introduction	81
4.2	Production planning	81
4.3	Production systems	83
4.4	Production planning and control in the apparel industry	88
4.5	Supply chain management in the apparel industry	94
4.6	Inventory management	97
4.7	Manufacturing performance improvement through lean production	99
4.8	Waste management	103
4.9	Human resource management	104
4.10	New tools developed in production planning	105
	Acknowledgments	105
	References	105
5	Fabric sourcing and selection	109
	<i>A. Vijayan, A. Jadhav</i>	
5.1	Introduction	109
5.2	Fabric sourcing	110
5.3	Fabric inspection	115
5.4	Future trends	121
5.5	Conclusions	127
	References	127
6	Selecting garment accessories, trims, and closures	129
	<i>K.N. Chatterjee, Y. Jhanji, T. Grover, N. Bansal, S. Bhattacharyya</i>	
6.1	Part 1: introduction to garment accessories	129
6.2	Part 2: selecting garment accessories	129
6.3	Part 3: selecting supporting materials	136
6.4	Part 4: selecting closures	138
6.5	Part 5: accessories for children's wear	145
6.6	Part 6: evaluation of quality of trims and accessories	148

6.7	Part 7: fashion accessories	150
6.8	Conclusions	183
	Acknowledgments	183
	Bibliography	183
Part Two Garment design and production		185
7	Garment sizing and fit	187
	<i>R. Pandarum, W. Yu</i>	
7.1	Introduction	187
7.2	Geometry of the human form	188
7.3	The human figure divided into body proportions	189
7.4	Garment size charts	193
7.5	Development of garment size charts	194
7.6	Sizing and fit systems	197
7.7	Three-dimensional (3D) body scanning – current and potential future applications in clothing manufacture and retailing	200
7.8	Conclusions	201
7.9	Sources of further information	201
	Acknowledgements	202
	References	202
8	Pattern construction	205
	<i>K. Kennedy</i>	
8.1	Introduction	205
8.2	Pattern construction modes	206
8.3	Body, material and design	208
8.4	Pattern construction tools	213
8.5	Conclusions	218
8.6	2D and 3D CAD Web sites	219
	Acknowledgements	219
	References	219
9	Fabric spreading and cutting	221
	<i>I. Vilumsone-Nemes</i>	
9.1	Introduction	221
9.2	Cut process planning	221
9.3	Spreading of textile materials	223
9.4	Cutting of textile materials	230
9.5	Fusing of cut textile components	240
9.6	Final work operations of the cutting process	242
9.7	Future trends	244
9.8	Conclusions	244
9.9	Sources of further information	245

10	Sewing, stitches and seams	247
	<i>G. Colovic</i>	
10.1	Introduction	247
10.2	Stitch classes	248
10.3	Seam types	258
10.4	Seam-neatening	269
10.5	Future trends	270
10.6	Conclusions	271
10.7	Sources of further information and advice	272
	References	273
11	Sewing equipment and work aids	275
	<i>P. Jana</i>	
11.1	Introduction	275
11.2	Different bed types in industrial sewing machines	275
11.3	Different feed types in industrial sewing machines	280
11.4	Cyclic sewing machines	289
11.5	Computerised sewing machines	291
11.6	Work aids	295
11.7	Sewing automats	302
11.8	Sewing needles	306
11.9	Sewing threads	310
11.10	Future trends and conclusions	312
11.11	Sources of further information and advice	313
	References	314
12	Sewing-room problems and solutions	317
	<i>M. Carvalho, H. Carvalho, L.F. Silva, F. Ferreira</i>	
12.1	Introduction	317
12.2	Seam pucker and other surface distortions	317
12.3	Sewing defects caused by needles	322
12.4	Material feeding and associated problems	324
12.5	Problems in stitch formation	325
12.6	Thread breakage	328
12.7	Future trends	328
12.8	Conclusions	334
12.9	Sources of further information and advice	334
	References	334
13	Alternative fabric-joining technologies	337
	<i>E.M. Petrie</i>	
13.1	Alternatives to sewing	337
13.2	Adhesive bonding	341
13.3	Conventional thermal welding	356
13.4	Advanced thermal-welding processes	363
13.5	Conclusions	370
	References	371

14	Seamless garments	373
	<i>N. Nawaz, R. Nayak</i>	
14.1	Introduction	373
14.2	Seamless technique	373
14.3	Common seamless products	376
14.4	Raw materials	377
14.5	Seamless knitting machines	377
14.6	Advantages of seamless garments	379
14.7	Disadvantages of seamless garments	380
14.8	Applications of seamless garments	381
14.9	Future developments	382
14.10	Conclusions	382
	References	383
 Part Three Garment finishing, quality control, care labelling and costing		 385
15	Garment-finishing techniques	387
	<i>S. MacA. Fergusson</i>	
15.1	Introduction	387
15.2	Garment finishing for functionality	388
15.3	Knitwear finishing	393
15.4	Denim garment finishing	396
15.5	Pressing (factors and equipment)	397
15.6	Future trends	401
15.7	Conclusions	402
	References	402
16	Quality control and quality assurance in the apparel industry	405
	<i>C.N. Keist</i>	
16.1	Introduction	405
16.2	Quality control in the apparel industry	406
16.3	Future trends	423
16.4	Conclusions	424
16.5	Sources of further information and advice	425
	References	425
17	Care labelling of clothing	427
	<i>R. Nayak, R. Padhye</i>	
17.1	Introduction	427
17.2	Requirements of care labelling	427
17.3	Definition of care label	429
17.4	Care labelling systems	431
17.5	Future trends	444
17.6	Conclusions	445
	References	446

18	Garment costing	447
	<i>A. Singh, K. Nijhar</i>	
18.1	Introduction	447
18.2	Costing need	447
18.3	Cost classification	449
18.4	Cost elements	450
18.5	Measures of efficiency	451
18.6	Profitability	452
18.7	Garment sales element analysis	454
18.8	Mark-downs	461
18.9	Managing cost through inventory control	463
18.10	Apparel costing sheet analysis	464
18.11	Conclusions	467
	References	467
	Index	469