

14 Moulding, enrobing and cooling chocolate products, 356*Michael P. Gray, revised and updated by Ángel Mániz-Cortell***14.1 Introduction, 356****14.2 Moulding, 356****14.2.1 Background, 356****14.2.2 Loose and fixed mould plants, 357****14.2.3 Mould conditioning, 360****14.2.4 Depositors, 361****14.2.5 Adding inclusions, 363****14.2.6 Removal of air bubbles, 364****14.2.7 Shell forming, 364****14.2.8 Centre filling, 365****14.2.9 Backing off, 365****14.2.10 Cooling, 367****14.2.11 Demoulding, 370****14.2.12 Troubleshooting demoulding problems, 371****14.2.13 In-line storage systems, 373****14.2.14 Keeping moulds clean and changeovers, 374****14.2.15 Other methods for shelling forming, 374****14.2.16 Troubleshooting moulded product faults, 377****14.2.17 Mould design, care and innovations, 379****14.3 Enrobing, 383****14.3.1 Background, 383****14.3.2 Basic layout of an enrober, 384****14.3.3 Enrobers with inbuilt temperers, 384****14.3.4 Enrobers with external temperers, 385****14.3.5 Chocolate recirculation, 385****14.3.6 Temper, 387****14.3.7 Product centre, 387****14.3.8 Enrober components, 387****14.3.9 Changeovers, 393****14.3.10 Avoidance of air bubbles, 393****14.3.11 Avoidance of chocolate build-up inside an enrober, 393****14.3.12 Downstream processes, 394****14.3.13 Cooling, 395****14.3.14 Troubleshooting enrobed product faults, 397****Conclusions, 398****Acknowledgements, 398****References and further reading, 398****15 Non-conventional machines and processes, 400***Dave J. Peters***15.1 Introduction, 400****15.2 Ultrasound, 400**

- 15.3 High shear/low temperature crystalliser, 402
- 15.4 High pressure temperer, 404
- 15.5 Extrusion, 405
 - 15.5.1 Types of extruders, 405
 - 15.5.2 The extruder as a flavour modifier, 407
 - 15.5.3 The extruder as a chocolate conche, 407
 - 15.5.4 The extrusion of tubular shapes, ropes and nets, 410
- 15.6 “Single shot” depositors, 413
 - 15.6.1 Background, 413
 - 15.6.2 Basic principle of single shot depositing, 414
 - 15.6.3 Limitations of single shot depositing, 415
 - 15.6.4 Key control parameters, 417
- 15.7 Aeration of chocolate, 418
 - 15.7.1 Types of aeration, 418
 - 15.7.2 Vacuum aeration, 419
 - 15.7.3 High pressure aeration systems, 419
 - 15.7.4 Water evaporation methods, 420
- 15.8 Cold forming technologies, 421
 - 15.8.1 Background, 421
 - 15.8.2 Typical cold forming process, 422
 - 15.8.3 Advantages of cold forming technologies, 424
 - 15.8.4 Disadvantages of cold forming, 426
 - 15.8.5 Cold forming variants, 427
- 15.9 Paste conching, 428
- Conclusions, 428
- References, 429

16 Chocolate panning, 431

Marcel Aebi, revised by Mark S. Fowler

- 16.1 Introduction, 431
 - 16.1.1 History, 431
 - 16.1.2 Definitions, 431
- 16.2 Panning methods, 432
 - 16.2.1 Chocolate panning, 433
 - 16.2.2 Soft coatings, 433
 - 16.2.3 Hard coating, 433
 - 16.2.4 Film and suspension coating, 433
- 16.3 The process of chocolate panning, 434
 - 16.3.1 Centre selection, 434
 - 16.3.2 Centre preparation, 435
 - 16.3.3 Selection of chocolate and compound coatings, 438
 - 16.3.4 Chocolate and compound engrossing, 439
 - 16.3.5 Polishing and sealing, 442
- 16.4 Packaging and storage, 444