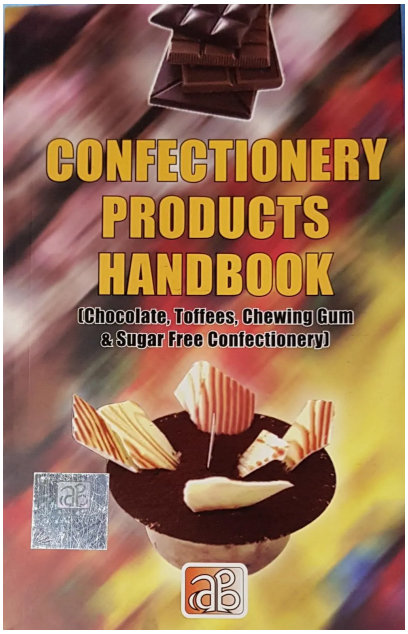
Entrepreneur India

106-E, Kamla Nagar, New Delhi-110007, India.
Tel: 91-11-23843955, +91 9097075054
Mobile: +91-9097075054
Email: npcs.ei@gmail.com, info@entrepreneurindia.co
Website: www.entrepreneurIndia.co



Confectionery Products Handbook (Chocolate, Toffees, Chewing Gum & Sugar Free Confectionery)

Code	NI254
Format	paperback
Indian Price	₹1975
US Price	$200
Pages	672
ISBN	9788178331539

Publisher	Asia Pacific Business Press Inc.

Description

Confectionery manufacture has been dominated by large scale industrial processing for several decades. Confectionery implies the food items that are rich in sugar and often referred to as a confection and refers to the art of creating sugar based dessert forms, or subtleties (subtlety or sotelty), often with pastillage. The simplest and earliest confection used by man was honey, dating back over 3000 years ago. Traditional confectionery goes back to ancient times, and continued to be eaten through the Middle Ages into the modern era.
Sugar confectionery has developed around the properties of one ingredient – Sucrose. It is a non- reducing disaccharide. The principal ingredient in all confectionery is sucrose, which in its refined form has little flavour apart from its inherent sweetness. This handbook contains Packaging in the confectionery industry, Structure of sugar confectionery, Flavouring of confectionery, Confectionery plant, Ingredients, Quality control and chemical analysis, Medicated confectionery and chewing Gum, Chocolate flow properties, General technical aspects of industrial sugar confectionery manufacture, Manufacture of liquorice paste, Extrusion cooking technology, Manufacture of invert sugar, Marzipan and crystallized confectionery.
The manufacture of confectionery is not a science based industry, as these products have traditionally been created by skilled confectioners working empirically. The aim of this handbook is to give the reader a perspective on several processes and techniques which are generally followed in the confectionery industry. The texture and technological properties of confectionery products are to a large extent controlled by its structure.
The book is aimed for food engineers, scientists, technologists in research and industry, as well as for new entrepreneurs and those who are engaged in this industry.

Content

1. INTRODUCTION
History
Raw materials
1. Physical and chemical properties
2. Sweetening ingredients
3. Other raw materials
Properties and microbiology of confectionery
Types of confectionery

Process and Machinery for confectionery production
Modern developments
Production of typical confectionery products
Fondant
Production of fondant
Casting fondant articles
Figure 1. Baker - Perkins fondant machine
Figure 2. NID high speed mogul molder
Caramel, fudge, and toffee
Formation of caramel bars and small units
Boiled sweets, hard candy, brittle, croquante,
and butterscotch
Marshmallows and nougat
Jellies, gums, and turkish delight
Panning
Other products
Packaging, storage, and economic aspects
2. PACKAGING IN THE CONFECTIONERY INDUSTRY
Trends and developments
The purpose of a package
The container
Materials
Metal cans
Paper and associated materials

Types of paper
Metal foil
Transparent films
Metallized films
Shrink and stretch films
Laminates
Selection and use of wrapping materials for
chocolate and confectionery
The machinery
The type of wrap
Physical properties of wrapping materials-testing methods
Strengh
Permeability
Physical structure
Printing odors in food wrappers

Testing of wrappers for various other properties
Resistance of printing ink and varnish to tropical conditions
Toxicity
Wrapping materials in display and advertising
Testing of wrapping and advertising material for fading
Adhesives
Physical properties of adhesives
Adhesive groups
Mechanical sealing methods
Adhesive tapes
Metal containers
Types of cans
Built-up body
Dessicant pouches
3. SUGAR, SYRUP, CONFECTIONERY AND SWEETENERS
Introduction
Composition
The production of beet sugar
The production process for beet sugar
The production of cane sugar

The production process for cane sugar
Kinds of sugar
Kinds of syrups
Confectionery, liquorice and wine gums
Confectionery
Liquorice
Wine gums and soft gums
Sweeteners
The energy-supplying sweeteners
Saccharides
Polyalcohols
Non-nutritive sweeteners
Quality deterioration, spoilage and storage
4. FOOD VALUE OF CHOCOLATE AND CONFECTIONERY
Food value and the composition of foods
Carbohydrates
Fats
Proteins
Mineral matter

Vitamins
The Labeling of Foods Containing Vitamins
Food values of chocolate and confectionery
Calculation of caloric value of a food
Supposed harmful effects of confectionery
The virtues of confectionery
5. STRUCTURE OF SUGAR CONFECTIONERY
Introduction
Toffee
Starch gels
Pectin gels
Gelatin gels
Other protein gels
Boiled sweets and pulled sweets
Panned sweets and coatings

Chocolate-flavoured couvertures
Concluding comments
6. LIQUORICE PASTE, CREAM PASTE AND AERATED CONFECTIONERY
7.

Liquorice paste: introduction
Liquorice paste: ingredients
1. Treacle
2. Wheat flour
3. Liquorice extract
4. Caramel
5. Rework
(The manufacture of liquorice paste)
1. Premixing
2. Cooking
3. Extrusion
Cream pastes: introduction
Cream pastes : ingredients
The manufacture of cream paste
The extrusion of cream paste
Liquorice allsorts
Aerated confectionery: introduction
Methods of aeration

1. Mechanical aeration
2. Chemical aeration
Marshmallow
1. Batch marshmallow
2. Continuous marshmallow
Nougat
CHEMISTRY OF FLAVOUR DEVELOPMENT IN CHOCOLATE
Introduction
Fermentation
Drying
Roasting
1. An introduction to browning reactions

2. A closer look at browning reactions
Conching
Conclusion
8. CONFECTIONERY COATINGS, CHOCOLATE REPLACERS, DIETETIC COMPOUNDS
Confectionery coatings
Ingredients
Manufacturing processes
Conditions to be observed during production
Colored coatings and pastel coatings
Formulations
Dietetic coatings
Diabetic chocolate
Carob coatings
Defatted wheat germ
Medicated chocolates
9. CHOCOLATE BARS AND COVERED CONFECTIONERY
Production methods
Molding
Enrobing
Panning
Tempering
Other chocolate processes
Chocolate drops (chips)
Roller depositing

Aerated chocolate
Chocolate flake or bark
Chocolate vermicelli or streusel
Laminated chocolate
Chocolate tempering
Compound coatings
Measurement of degree of temper
Chocolate molding
Molding chocolate blocks or bars

Hollow goods
Foiled articles
Shell forming equipment
The westal SCB process
Composition of chocolate for molding
molding and shell plant coolers
Tablets
Shells
Good manufacturing practice
Chocolate enrobing
Mechanical
Chocolate cooling
Enrober coolers
Automatic enrober systems
Chocolate enrobing problems
Chocolate panning
Zein glazes
10. CONFECTIONERY AND EXTRUSION COOKING TECHNOLOGY
Introduction
Problem description
Curently realised extrusion cooking processes
Extrusion of starch
Extrusion of dry sucrose crystals
Extrusion of sucrose-starch mixtures
Extrusion of sucrose-syrup mixtures
Coextrusion
1. Die design
2. Size restrictions
3. Recipe restrictions

4. Density influence
5. Centre pumping
6. Post-processing
7. Cutting
8. Process economics

11. SUGAR CONFECTIONERY IN THE DIET
Confectionery in society
Confectionery as food
Energy
Nutrients
1. Carbohydrates
1.1 Starch
1.2 Sugars
2. Fats
3. Protein
4. Vitamins
5. Minerals
What food does: how it provides energy,
growth and maintenance
1. Confectionery as part of a healthy diet
2. Nutritional content of sugar confectionery
Nutrition labelling
1. Calculated nutritional data
2. Analysed nutritional data
3. Which nutrients are needed?
4. Development of nutritional content
Labelling sugar confectionery
Confectionery and the critics
1. Obesity
2. Additives
3. Hyperactivity or hyperkinesis
4. Dental caries
5. Other criticisms
Conclusion
12. THE FLAVOURING OF CONFECTIONERY
Introduction
Basic confectionery types, recipes, inherent flavours
2. Fat boilings
3. Toffees and caramels

4. Fudge

5. Fondant
6. Candy
7. Cream and lozenge paste
8. Compressed tablets
9. Jellies and gums
10. Chewing gum
11. Panned work
12. Chocolate
Flavours from ingredients
Flavours developed during processing
Selection of flavourings
13. EMULSIFIERS, COLOURS AND FLAVOURS
Emulsifiers
Sources of emulsifiers
Legislation
Examples of emulsifiers
Lecithin
Sucrose esters, E473
Uses of emulsifiers in sugar confectionery
Colours
Technical Requirements of colours in sugar confectionery
Synthetic colours
Lake colours
Interference colours
Natural colours
Caramel, E150
Chlorophyll, E140
Copper chlorophyll, E141
Cochineal, E120
Roboflavin, E101
Riboflavin-5-phosphate, E101a
Carbon black, E1 53
Curcumin, E100
Crocin
Carotenoids

β-Carotene, E160(a)

Annatto, E160(b)
Lutein, E161(b)
Betalaines
Anthocyanins
Flavours
Natural flavours
The image of natural products
Nature-identical flavourings
The case of nature-identical flavours
Synthetic flavours
Dosing
Development in flavours
Antioxidants
Synthetic antioxidants
Tocopherols
14. CONFECTIONERY PLANT
Confectionery plant
Steam injection cooking
Vacuum cooking
Continuous plant
15. INGREDIENTS
Ingredients
Molasses and treacle
Invert sugar
Glucose syrup (corn syrup)
Fructose
Dextrose
Lactose
Dairy ingredients
Sweetened condensed milk
Evaporated milk (unsweetened condensed milk)
Milk powder
Butter

Butter oil (anhydrous milk fat)
Whey
Vegetable fats
Gums and gelling agents or hydrocolloids
Agar agar, E406
Alginates, E401
Carrageenan

Gelatine
Gellan gum, E418
Gum acacia, also known as gum arabic, E414
Guar gum
Pectin
Starch
The cooking of starch
Obtaining different properties in the starch
The use of starch in confectionery
Thin boiling starches
Pre-gelatinised starches
Oxidised starches
Non-gelling starches
Gum tragacanth, E413
Locust bean or carob bean gum
Xanthan gum
Egg albumen
Practical forms of egg albumen
Properties of egg albumen
Testing egg albumen
Substitutes for egg albumen
Chewing gum ingredients
Chicle
Jelutong
16. CHEWING GUM
Gum base characteristics
Texturisers

Antioxidants
Sugars
Dextrose
Glucose syrup
Loss or gain of moisture
Flavours
17. TRADITIONAL CHOCOLATE MAKING 334-338
History
Outline of process
1. Preparation of cocoa nib - flavour development
2. Grinding-particle size reduction
3. Conching—flavour and texture development
18. SUGAR-FREE CONFECTIONERY 339-350

Laxative effects
The sugar substitutes
Bulk sweeteners - the polyols
Maltitol
Erythritol
Isomalt
Polydextrose
Intense sweeteners
Aspartame
Acesulfame K
Saccharin
Stevioside
Thaumatin
Neohesperidine dihydrochalcone (NHDC)
Sucralose
Synergy
The Chemistry of sweetness
Making sugar-free products
Reducing the energy content
Sugar-free products
Chewing gum
Boiled sweets

The problems of making sugar-free high boilings
from isomalt
Gums and jellies
Turkish delight
Toffee
Controlled calorie products
19. QUALITY CONTROL AND CHEMICAL ANALYSIS
Introduction
Designer quality
Control of raw materials and packaging
1. Receipt of materials
2. Sampling
3. Testing
Process control
Finished packs
Sensory evaluation

Hygiene
1. Microbiological testing
2. Foreign matter
Legislation
Chemicals analysis
1. Laboratory practice
2. Sugar analysis
3. Moisture content
4. Protein
5. Fat analysis
6. Aflatoxins
7. Viscosity
8. Particle size
9. Acid content
Modern methods
Conclusion
20. MEDICATED CONFECTIONERY AND CHEWING GUM
Medicated sugar confectionery
High boiled sugar medicated confectionery

Third ingredient addition
Continuous operations
Depositing high boilings
The 'Apollo' centre-filling line from Euromec
The centre-filler hopper and pump unit
Bosch
Salvage
Chewy medicated confections
Gum products
Chewing gum
Packaging
Concluding remarks
21. CHOCOLATE FLOW PROPERTIES
Flow behaviour of chocolate
How to measure flow properties
1. Rotational viscometers
Miscellaneous instruments
Factors affecting the flow properties of chocolate
1. Fat content

2. Lecithin and other emulsifiers
3. Moisture content
4. Particle size distribution
5. Temperature
6. Conching time
7. Temper
8. Thixotropy
9. Vibration
Conclusions
22. GENERAL TECHNICAL ASPECTS OF INDUSTRIAL SUGAR CONFECTIONERY MANUFACTURE
Introduction
Compositional effects
1. Sugars
2. Fats
3 Thickeners and stabilisers

4. Proteins
Change of composition
1. Caramelisation
2. Inversion
3. Maillard reaction
4. Secondary reactions
Change of state

1. Crystallisation
2. Polymorphism
3. Starch
4. Enzymic changes
Environmental behaviour
Evaporation
Sweetness and taste
23. CARAMEL TOFFEE AND FUDGE
Introduction
Ingredients
1. Sugar
2. Glucose syrup
3. Milk protein
4. Fat
5. Salt
6. Water

7. Other additivies
Structure of toffee
Formulation
Processing

1. Equipment
2. Slab process
3. Cut and wrap process
4. Depositing
Toffee texture
Fudge

24. TOFFEES AND CARAMELS

Cooking toffees
A typical toffee
Sugar
Glucose syrup 42 DE
Condensed milk
Fat
Optional ingredients
Whey powder
Hydrolysed whey syrup
Invert sugar syrup
Brown sugar
Golden syrup
Emulsifiers
Glucose syrup 68 DE or higher
Isomerised glucose, also known as isoglucose or
High fructose corn syrup
Salt
Flavours and flavourings
Colour
The process
Dissolving
Emulsifying
Cooking
Shaping the toffee
The slab process
Cut and wrap process
Depositing

Toffee as an ingredient of other products
Formulation considerations
Toffee in a chocolate-coated countline
Toffee in a moulded chocolate product
25. CHOCOLATE TEMPER
Introduction
Techniques

Polymorphic transitions of triglycerides
Liquid state
Crystallization
The α-form
The β'-forms
The β -form
The β'1 —> β transition
Triple chain length structures
Cocoa butter
The crystallization of mixtures
26. TABLETS, LOZENGES AND SUGAR PANNING
Introduction
Tableting
Granulation
1. Wet granulation
2. Fluidised bed granulation
3. 'Slugging'
Ingredients
1. Base materials
2. Binders
3. Lubricants
4. Disintegrants
5. Colours and flavours
Compression
1. Bonding during compression
Problem solving
1. Capping
2. Sticking and picking
3. Pitting
4. Mottling
5. Size and weight variation
Lozenges

1. Composition
2. Processing

3. Drying
Sugar panning
1. Equipment
2. Automatic panning systems
3. Auxillary equipment
Hard panning

1. Pretreatment of centres
2. Engrossing
3. Non-pareils (hundreds-and-thousands)
Soft panning
Flavour and colour

1. Flavour
2. Colour
Polishing
Additional panning techniques

1. Alternative sweeteners
2. Silvering
27. SUGAR CONFECTIONERY, CHOCOLATE, JAMS AND JELLIES
Agar-agar
Anti-tailing devices
Automatic continuous sugar cooker
Non-vacuum cooker
Batch roller
Cacao
Cacao butter
Cacao moth
Cacao selection
Caramel
Chocolate-confectionery research
Clayed cacao
Colours for confectionery
1. Selection of colouring matter
2. Method of dissolving
3. Concentration and purity

Conches
Circular or rotary conches
The theory of conching
Confectioners' glucose
Continuous vacuum sugar cookers
Cream beaters
1. The beater should be kept cool.
2. The syrup should be kept in the beater sufficiently long to ensue complete crystallisation.

Air-cooled cream beaters
Cream and fondant making plant
Dextrose
Diabetic foods - chocolate
Dragee pans
Egg albumen
Enrobers
Automatic temperature control
Fermentation of cacao beans
Flavourings
Classification of flavouring materials
Fondant paste
Fumigation with ethylene oxide
Gas fires for sugar boiling
Half-coating device
Heat penetration of cacao
Invert sugar
Use in confectionery
Manufacture of invert sugar
Jam manufacture - scientific principles
Pectin
Sugar
Acidity
End point of boil
Statutory regulations
Standard for jam

Standard for marmalade
General
Technique of manufacture
Fruit preparation
Preparation of juice for "jelly" jams

Preparation of recipes
Boiling
Cooling, filling and capping
Storage
Jelly crystals
Jelly manufacture
Gelatin testing
Proportions of ingredients
Boiling and mixing
(1) preparation of gelatin
(2) preparation of the sugar syrup
(3) mixing and dissolving
Choice of colour
Clarification
Cooling and setting
Cutting
Packaging
Production control
Lactic acid
Lecithin
Lemon curd
Liquid sugar/liquid glucose mixtures
Liquorice
Liquorice products
Machines for the manufacture of
hard-boiled goods
Maple sugar
Marmalade manufacture
Grading
Steaming barrels
Peeling
Gouging
Pulp and dummy
Peel
Juice
Recipes
Boiling
Marshmallow beaters
Marzipan
Marzipan fruits and mosaics
Marzipan substitutes

Melangeurs
Milk chocolate
Mogul machine
1. The starch must be clean and dry.
Piping jelly
Piping jelly from fruit puree and agar-agar
Piping jelly from fruit puree and pectin
Piping jelly from fruit and sugar
Refiners
Refractometers
Roasters
Unit roasters
Continuous roasters
Steam roasters
Principles of roasting
Changes brought about in cacao beans owing to roasting The removal of shell from the NIB
(1) Chemical changes
(2) Physical changes
Steam pans
Sugar
Bibliography
Sugar for the chocolate manufacturer
Sugar for the confectioner
Testing of refined sugars

Tempering and storage kettles
The outlet valve
Thermometers for sugar boiling
The recording dial thermometer
Adjustment of thermometers: the effect
of barometric pressure on the boiling-point
Toffee
Physical nature of toffees and caramels
Flavour
Colour
Texture
Shelf life
Graining
Raw materials
Manufacture

Wrapping and packing
Vacuum pans
Vertical mixers
Winnower
28. CENTERS, FONDANTS, MARZIPAN AND CRYSTALLIZED CONFECTIONERY
Introduction
Recipes
Cremes
3. Fudge
Marzipan
Variables affecting the properties of fondant
Moisture content
The amount of sugar crystals present
The concentration and viscosity of the syrup phase
Crystal size of the sugar
Basic steps in making the confections
Fondant
Crème making

Fudge making
Marzipan
Uses of fondant
Making impression in starch
Uses of fudges and marzipan
Quality control in fondant cremes, fudges and marzipan
1. Moisture content
2. Soluble solids of the syrup phase
3. Sugar crystal size
4 Fat content
5. Density
Conclusion

About Niir

NIIR Project Consultancy Services (NPCS) is a reliable name in the industrial world for offering integrated technical consultancy services. Its various services are: Pre-feasibility study, New Project Identification, Project Feasibility and Market Study, Identification of Profitable Industrial Project Opportunities, Preparation of Project

Profiles and Pre-Investment and Pre-Feasibility Studies, Market Surveys and Studies, Preparation of Techno-Economic Feasibility Reports, Identification and Selection of Plant and Machinery, Manufacturing Process and/or Equipment required, General Guidance, Technical and Commercial Counseling for setting up new industrial projects and industry. NPCS also publishes various technology books, directories, databases, detailed project reports, market survey reports on various industries and profit making business. Besides being used by manufacturers, industrialists, and entrepreneurs, our publications are also used by Indian and overseas professionals including project engineers, information services bureaus, consultants and consultancy firms as one of the inputs in their research.