Table 20.1 Recipes for dark tablet chocolate.

Ingredient	Range for dark chocolate (%)	Typical medium quality bar (%)	Typical high cocoa solids recipe (%)
Cocoa mass	45–80	55	70
Sugar	20–55	44.5	30
Added cocoa butter	0–5		
Lecithin	0–0.5	0.5	
Flavour	<0.5		
Approximate total fat content		29	38–40; depends upon cocoa type and quality

If a given viscosity is required the quantity of cocoa butter can be adjusted or, in some cases, if the cocoa mass percentage goes over 60%, some of the cocoa mass is replaced with natural or slightly alkalised cocoa powder.

Table 20.2 Recipes for milk tablet chocolate.

Ingredient	Range for bar milk chocolates (%)	Typical medium quality bar recipe (%)	Typical high quality milk bar recipe (%)
Sugar	34–58	48	42
Non-fat milk solids	12–18		
Full cream milk powder		24	25
Cocoa butter	18–25	19.5	24.5
Cocoa mass	8–12	8	8
Milk fat	3.5–6.5		
Lecithin	0.3–0.5	0.5	0.5
Approximate total fat (milk fat plus cocoa butter)	26–38	26.5	35

The milk chocolate recipes could also be made using "chocolate crumb" to replace some or all of the cocoa mass, milk powder and sugar (see Chapter 6). If a softer milk chocolate is required, the full cream milk powder can be replaced with skimmed milk powder and milk fat (butter oil).

Table 20.3 contains recipes for different types of white chocolate that can be made into tablets.

When making white chocolate it is important that good quality fresh milk powder and high quality deodorised cocoa butter are used. It must be conched at 40–50 °C (104–122 °F). When a higher conching temperature is used, there is danger of "browning" the chocolate. If a "caramelised flavour" is preferred, the use of "white" chocolate crumb should be considered. When a "softer" white chocolate is desired, the full cream milk powder can be replaced with skimmed milk powder and milk fat.

Table 20.3 Typical recipes for white bar chocolate.

Ingredient	Range of ingredients (%)	Typical medium quality white bar chocolate (%)	Typical high quality white chocolate bar recipe (%)
Sugar	37–50	48	37
Non-fat milk solids	18–24		
Milk fat	4–7		
Full cream milk powder		29.5	33
Deodorised cocoa butter	22–35	22	30
Lecithin	0.2–0.5	0.5	
Approximate. total fat content (milk fat plus cocoa butter)	29–40	29.5	37.8

20.4.2 Chocolate confectionery products

The chocolate used for the confectionery industry is normally split in to three applications:

1 Bar forming and enrobing;
2 Shell moulding and one-shot systems;
3 Panning.

20.4.2.1 Chocolate for bar forming and enrobing

The requirements for bar forming and enrobing chocolate are:

1 Good hardness and contraction for bars, but not too hard to crack if used on firm or hard enrobed centres;
2 Flavour profile in harmony with the end product;
3 Viscosity and yield matching the requirement of the product and manufacturing plant.

Typical recipes for the major ingredients in milk, dark and white bar moulding and enrobing chocolate are given in Table 20.4.

The actual viscosity that is needed depends very much upon the type of temperer and enrober being used. It may be necessary to modify the flow properties of these recipes. A more fluid chocolate can be obtained by decreasing the sugar by 2–3% and increasing the cocoa butter. For a thicker chocolate the reverse applies, that is decrease the cocoa butter by 2–3% and increase the sugar by the same amount.

20.4.2.2 Shell moulding and one-shot systems

For shell moulding the chocolate can be similar to that used for enrobing, provided that the shell moulding plant has efficient vibrator and shaking systems, so as to be able to adjust the shell thickness to suit the products. If there is a problem with the "backing off" of the filled shells due to too high