Table 20.9 Typical recipes for enrobing a sponge cakes, gateaux or Swiss rolls.

Ingredient	Milk chocolate recipe (%)	Dark chocolate recipe (%)
Sugar	45	52
Skimmed milk powder	15	
Cocoa mass	11	30
Milk fat	7.5	7.5
Cocoa butter	21	10
Lecithin	0.5	0.5
Approximate total fat content	34.5	33

Table 20.10 Typical recipes for enrobing or half coating biscuits.

Ingredient	Milk chocolate recipe (%)	Dark chocolate recipe (%)
Sugar	47	52
Full cream milk powder	7	
Skimmed milk powder	5	
Whey powder[a]	5	
Cocoa mass	8	30
Milk fat	3.5	
Cocoa butter	24	17.5
Lecithin	0.5	0.5
Approximate total fat content	33.3	33.5

[a] If regulations allow, otherwise replace with skimmed milk powder.

20.4.4.2 Chocolate chips

Chocolate chips or chunks can be used for biscuit production, or for inclusions in cakes, muffins or toppings. The addition of chocolate chips should take place towards the end of the dough mixing. The ideal mix temperature of the biscuit dough should be below 18 °C (64 °F). The flour, sugar and fat may have to be cooled to achieve this biscuit dough temperature. If water is used in the biscuit dough this can be chilled or replaced with the same weight of ice. Additionally, cooling or freezing the chocolate chips/chunks before adding to the biscuit dough can be beneficial.

The baking times and temperatures can vary greatly, depending on type and size of biscuit and type of finish required. The baking temperature normally varies from 150 to 190 °C (302–374 °F) and the baking profile is also very important to the appearance and taste of the finished biscuit.

Great care must be taken if using milk chocolate chips/chunks not to "brown" the milk chocolate chips/chunks to the point where the chips are caramelised or taste of burned milk.

Table 20.11 Typical recipes for chocolate chips or chunks.

Ingredient	Dark chocolate recipe (%)	Milk chocolate recipe (%)
Sugar	49	52
Full cream milk powder		20
Cocoa mass	47	10
Cocoa butter	3.6	17.7
Lecithin	0.3	0.3
Salt	0.1	
Approximate total fat content	27.6	28

After baking they must be cooled as quickly as possible, to get firm chips showing on top of the biscuit/cookie and to stop biscuit fat migration into the chocolate. The temperature of the baked biscuit should be reduced to 23 °C (73 °F) or lower within 20 min. The temperature in the packing room should not be higher than 23 °C (73 °F) and should preferably be in the range 16–18 °C (61–64 °F).

For finished and packed chocolate chip biscuits and cookies the storage temperature should be between 16 and 18 °C (61–64 °F) with a relative humidity of 60% or less.

All the above procedures and temperatures also apply if chocolate chips are used for sponges and cup-cakes.

Typical recipes for dark and milk chocolates suitable for chocolate chip production are given in Table 20.11.

20.4.4.3 Chocolate-flavoured coatings for cakes and cake rolls

There are many chocolate-flavoured coatings used in the cake industry, due to cost or production implications (no tempering required). Most recipes are made with hardened or hydrogenated palm kernel oil (HPKO, Chapter 7) or other hardened vegetable fats, depending on application, cost, geographical location and so on.

Table 20.12 gives three recipes for chocolate-flavoured coatings based on HPKO fats, which are available in various melting profiles and hardness. It is necessary to work with your fat supplier to evaluate the best type and melting profile fat for your products. There are health concerns with some partially hydrogenated fats due to their trans fatty acid content (see Chapters 7 and 19).

Chocolate-flavoured coatings with HPKO fats have a short shelf life due to fat bloom.

If the shelf life needs to be extended beyond four weeks, an anti-bloom agent will have to be added to the coating fat. If further shelf life is required alternative fat to HPKO should be considered.