below freezing point. A web containing the lentils comes out below the rollers. This web is then broken after cooling, to release the individual pieces. The remaining web crumbs can then be melted and reworked.

14.2.16 Troubleshooting moulded product faults

14.2.16.1 Weight variability

If there are significant weight variations between the shells of moulded articles it is helpful to build a "map" by weighing individual shells from 10 consecutive moulds. If there is a pattern within each mould or between moulds, there are several possible causes:

- Incorrectly adjusted shakers.
- Temperature variations across the mould, possibly from the conditioning zone.
- Temper or temperature variations across the depositor hopper.
- Poor mould restraint due to broken or worn lugs on the mould (see Section 14.2.17).
- If using book moulds, the clips that hold the mould into the frame are not properly adjusted.

14.2.16.2 Cracking of hollow figures

For hollow figures, solidification and shrinkage may result in stress cracks due to too much contraction. A higher pre-crystallisation level (6–7 on a Sollich temper meter) should be used, and the moulds and the beginning of the cooling line should be run warmer.

14.2.16.3 Visual defects

Tablets with missing corners or holes (from air bubbles):

- Viscosity of the masse too high,
- Insufficient vibration,
- Ambient or mould temperature too low,
- Over-tempered,
- Inclusion level too high,
- Wrong deposit type – ideally need ribbon deposit for inclusions.

Curved bars:

- Incorrect temper,
- Cooling too rapid,
- Inclusions or centre expanding or contracting more than the chocolate,
- Poor design of bar with plinth (base) too thick.

Grey areas and spots:

- Local de-tempering due to incorrect mould or inclusion temperature, poor tempering or mixing in of un-tempered masse,
- Water stains or fatty specks on the surface of the mould due to inadequate mould washing,

Pale curvy lines:

- Poor temper,

Rub marks on bar sides:

- Incorrect setting of demould belt height or speed, or hammer/mould twist not set correctly,
- Demould not quite good enough, causing tablets to partially release,
- Such marks can also often be caused by the wrapping machines.

14.2.16.4 Breakage at demould

Breakage at demould can occur due to poor mould design, for example when the product sticks to the mould due to sharp corners, or there is too much flat, non-engraved surface.

A shelled tablet with chunks or cubes, having a base or plinth that is too thin compared to its height, will break when dropping out of the mould. On a typical 10 mm (0.4 in) deep 100 g (3.5 oz) tablet, the plinth should be at least 5 mm (0.2 in) thick. A bar with an odd number of cubes is less likely to break. If a thinner plinth is needed, adding reinforcing ribs of chocolate between the cubes will help. The base and the cubes of such a tablet should have radii of 0.75–1.0 mm (0.03–0.04 in) to get even contraction. Sharp radii will cause the shell to have thin areas and result in leakage of the central ingredients or breakage. Very large deep tablets (e.g. 300 g) can bend and even break in the mould due to contraction of the plinth if it is too thick.

14.2.16.5 Formation of meniscus

Feathering is a thin rim of chocolate or meniscus around the edge of the bottom of a chocolate product (Figure 14.15). It can be caused by the mould being too deep, or by shaking a solid product too much. Some additional depth is necessary to avoid spillage, but there should be no more than 0.5 mm (0.02 in) in a small piece (less than 50 g (1.8 oz)] or 1 mm (0.04 in) in a bigger item. When a meniscus occurs and breaks off during demoulding or wrapping, chocolate

Figure 14.15 Picture of meniscus on a chocolate bar, showing a piece broken off.