**Figure 3.7** Schematic diagram of the heated gas flow within a JND Continuous Rotary Louvre Roaster. (JND Technologies Limited, Retford, UK).

Figure 3.9. There are many different mills that are available and the main types are described in Chapter 9.

### 3.7.2 Quality of cocoa mass for the chocolate industry

The microbiological quality of the cocoa mass is a key parameter for the industry. Due to high total plate counts ($>1 \times 10^6$ colony-forming units per gram; cfu/g) and the presence of *Salmonella* in cocoa beans, heat treatment must be applied to obtain a product which meets the generally accepted cocoa mass specifications given in Table 3.1.

Bean blends are often used to obtain the desired flavour characteristics. Generally West African cocoa beans are used in Europe for chocolate production but, due to the increased interest in high cocoa containing chocolates, South American and/or West Indian cocoa beans are also used in blends (see Sections 2.7.9 and 20.2.3). Recently single origin chocolates have also become very popular. The roasting conditions of the cocoa beans and/or nibs are of great importance to obtain the optimum delicate flavours. When manufacturing high cocoa containing chocolate, the cocoa masses are often added directly into the conche and these must be free from coarse particles to avoid the product tasting gritty. Preferably the particle size of this type of cocoa mass should be around 20 μm (measured by micrometer).

**Figure 3.8** Cocoa nib pregrinder (Royal Duyvis Weiner). Reproduced with permission of Royal Duyvis Weiner.

### 3.7.3 Quality of cocoa mass for the production of cocoa powder and butter

The cocoa pressing industry also selects beans on the basis of their colour forming characteristics, which is particularly important for the production of dark coloured cocoa powders. For cocoa powder production the nibs are normally treated with an alkaline solution. This alkalisation process was developed in the nineteenth century in Holland and for this reason is also called the Dutching process. This results in darker products and, depending on the processing conditions, red and/or brown colours will be formed. It also has an impact on the cocoa flavour and, very often, alkalised cocoa powders are preferred in many food and drink applications.