

# Paperthin

MAKING REALLY THIN DOUGH FOR STRUDEL IS TECHNICALLY RATHER COMPLICATED BECAUSE CONVENTIONAL TECHNOLOGY CAN NOT HANDLE SUCH DOUGH

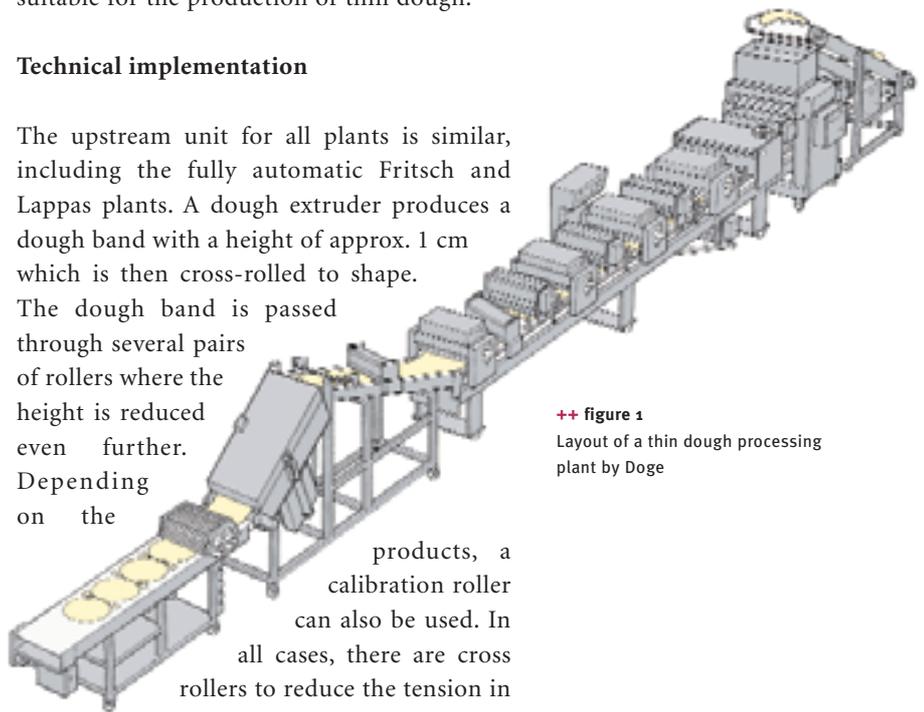
**+** The market for thin dough equipment is rather small. Industry experts estimate the total number of automatic plants of this kind worldwide to be far below 150. However, the market seems to be expanding. Manufacturers of such plants report that mainly in the Arabic world an increasing demand can be observed. Complete automation of thin dough production seems to be the main reason because it makes sense considering the high costs of labor in those countries. More decisive, however, is the uniform quality of the products which are almost completely distributed via trade channels. Classic thin doughs are extremely thinly rolled, stretched or pressed doughs. Thin dough plants reach their technical and technological limit with a dough band height of 0.2-0.5 mm. If the product – for example Turkish Baklava – requires even thinner dough, there are only two options. With the first, the dough is flour dusted and folded into packs which are then rolled out manually. This requires manual skills as well as a technologically adjusted flour. The second option is offered by only two engineering companies. It is an automatic stretching system which is capable of reducing the height of the doughs even more after they have passed the common roller heads and calibration units. Such machines for the fully automatic production of stretched doughs are manufactured by the German company Fritsch GmbH, Markt Einersheim, and by the Greek company J. Lappas Ltd, Athens.

## Technical features

A flour with about 30% protein is suitable for non-laminated doughs. The gluten should be very extendable, the falling number above 320 s and the amylogram in the range of 700. Most recipes provide for a 2% addition of fat (referred to flour) which makes the dough soft and thus improves the workability. For most products made from thin dough a distinct formation of pores is undesirable. Therefore, weak flours which also delay fermentation are suitable for the production of thin dough.

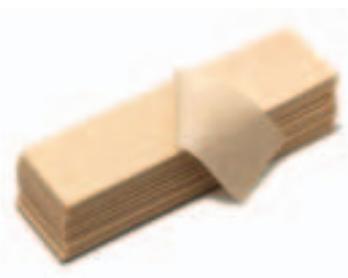
## Technical implementation

The upstream unit for all plants is similar, including the fully automatic Fritsch and Lappas plants. A dough extruder produces a dough band with a height of approx. 1 cm which is then cross-rolled to shape. The dough band is passed through several pairs of rollers where the height is reduced even further. Depending on the



**++ figure 1**  
Layout of a thin dough processing plant by Doge

products, a calibration roller can also be used. In all cases, there are cross rollers to reduce the tension in the dough and thus prevent the ▶





dough from tearing. Such roller lines can be 10 to 12 m long, depending on the products, and have an hourly capacity of up to 300 kg dough. The belt speed of such a plant is 10-15 m/s.

Plants offered by Rondo Doge, Schio, Italy, and Rademaker B.V., Culemborg, The Netherlands, are fully automatic to produce a dough height of 0.2 mm. Further thinning of the dough is done either manually by folding the dough and rolling it with a rolling pin and by the use of large tables on which the dough is stretched manually to the desired height.

The automatic thin dough plants by Lappas and Fritsch can be expanded by an automatic dough stretching module. The dough is fed onto spreading belts which start with 600 mm width and slowly spread to reach a width of 1,200 or 1,300 mm at the dough discharge. The dough is stretched using a simple but effective way. The dough band is not just handled by one belt, but also by another belt which comes from above and squeezes the dough. With the gradual spreading of the belts, the dough band is equally spread as well. To prevent the dough from tearing, it must meet certain technological requirements, but the spreading length also must be very long, about 6 to 8 m.

#### Release agent flour

In general, when producing baked goods, as little flour as possible is used during make-up to prevent sheeting defects. For the production of thin doughs, this is different. The dusting flour has a decisive technological task which is namely to keep the dough dry to facilitate much thinner stretching or rolling.

Also, the dusting flour ensures that the dough does not stick to the rollers. This makes it necessary to apply flour not only to the surface of the belt but also to the underside. At the start of each rolling module, the belt is first dusted with plenty of flour when it is below working height. The belt moves upwards and the dough band is placed onto a bed of flour. Downstream of the rolling and stretching lines, all machine manufacturers offer modular designed cutting stations in which moving dies cut the dough. The shape of the dough pieces is governed by the type of roller used.

#### Continuous heating plate oven

All manufacturers also offer downstream continuous ovens. In these the thin dough plates are slightly baked via bottom radiation heat. The texture of most products turns out to be chewier and a bit leathery. The dough pieces are preserved that way and do not need to be refrigerated. They can also be packed in stacks of 10 or 12 into plastic bags.

#### Further enhancement

As well as the dough pieces being sold in different shapes and sizes, there are also ready-to-use products available. For their production, the manufactures offer different enhancement modules. Next to the option to spray the dough with fat – which can also be done in the feeding section of the drying oven – some equipment can be used to apply a filling, usually a savory filling, onto the thin dough. The product can then be rolled up, automatically cut and placed on baking sheets. +++

