Technical Paper

No. 4

TECHNOLOGY

OF

LAMINATED PRODUCTS

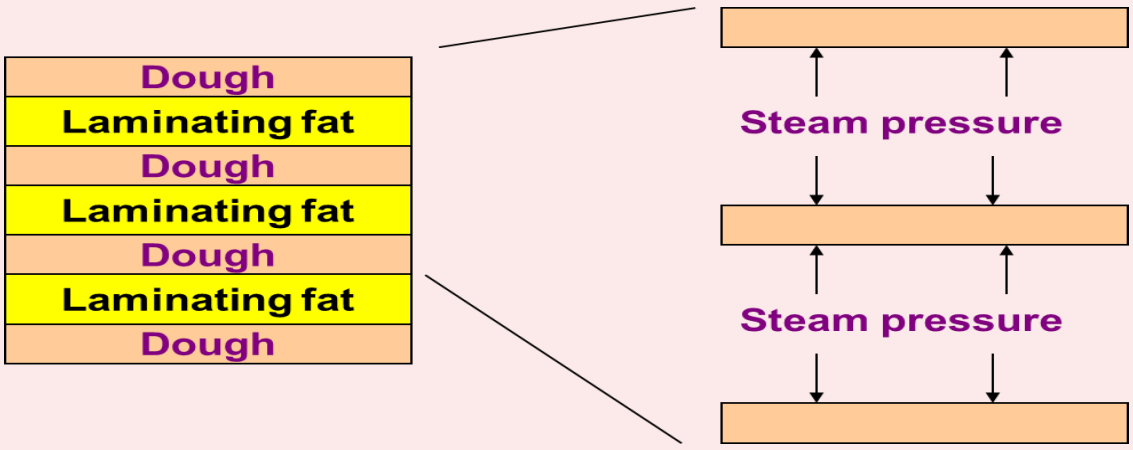
TECHNOLOGY OF LAMINATED PRODUCTS

Product Types and Key Characteristics

The family of laminated products encompasses un-yeasted forms commonly referred to as puff pastry and yeasted forms such as croissants and Danish pastry, the latter is known by many names including – Wiener brod (Vienna bread) in Denmark, Plunder in Germany and laminated Brioche and Fougasse in France. A key characteristic of all laminated products is the flaky eating quality formed as the result of creating alternate layers of dough and a suitable fat during processing. With the possible exception of croissant, few forms of laminated products are eaten as a simple pastry and are most commonly combined with a filling, topping or both. The fillings may be sweet or savoury.

What Causes the Lift in Laminated Products?

Puff pastry is usually un-yeasted and as referred to above, the basis of the necessary lift to deliver a flaky eating character starts with the formation of alternate and discrete layers of dough and fat. When the unbaked paste enters the oven and its temperature begins to rise, water in the dough layers begins to turn to steam and the fat in the paste begins to melt. The steam which is generated between the layers tries to escape to the surrounding atmosphere. The layering forms a series of natural lines along which the steam can travel to the oven atmosphere but the melting fat impedes the movement of the steam and the resulting build-up of pressure forces the dough layers apart.



Principle of laminated product expansion in baking.

TECHNOLOGY OF LAMINATED PRODUCTS

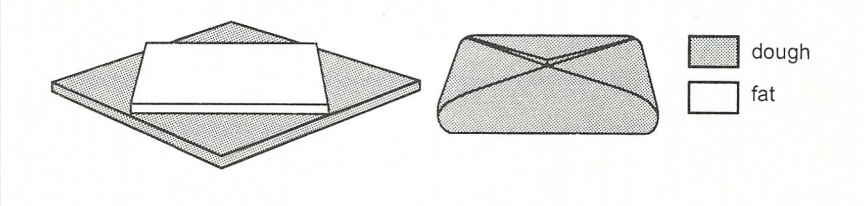
As the oven temperature continues to increase the dough layers begin to become rigid as they set and dry out. At this point the surface of the dough layers becomes very porous and large quantities of the melted fat fill-in the small holes which are formed in the dough. Some of the fat may be lost from within the product during baking and may collect on the trays which carry the product if high levels are used. Yeast action in yeasted laminated products contributes to the disruption of the integrity of the dough layers and tends to reduce pastry lift. However, some of the lift which is lost because of the disruption of the layers is compensated for by the generation and retention of carbon dioxide gas during proving and the early stages of baking, in much the same way as occurs with bread.

Production Methods

There are three traditional production methods employed in the small-scale manufacture of puff pastry; they are commonly known as the *French, English* and *Scotch, or Blitz.*

***French method* (*1 fat layer initially*)**

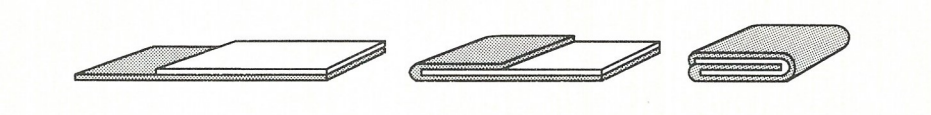
The base dough is sheeted out and half of the surface is covered with the laminating fat, the uncovered half is then folded over the laminating fat to form 2 dough layers enclosing 1 fat layer.



Principle of French method of puff pastry manufacture

***English method* (*2 fat layers initially*)**

The base dough is sheeted out and 2/3rds of the surface is covered with the laminating fat. The uncoated dough portion is folded over 1/3rd of the fat and then folded again so to create three dough layers enclosing two fat layers at the start of the sheeting and laminating process.



Principle of English method of puff pastry manufacture and initial stages of layer creation

Commonly the laminating fat will be sheeted or extruded to obtain the appropriate dimension. Thereafter the thickness of the dough is reduced by sheeting between sets of rollers and further folding or lamination is carried out.