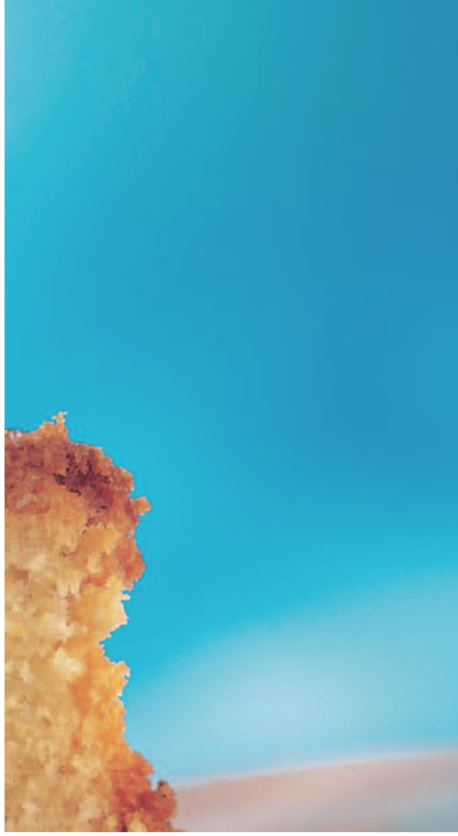
SPX®

In-House Shortening for the Bakery Industry



White Paper

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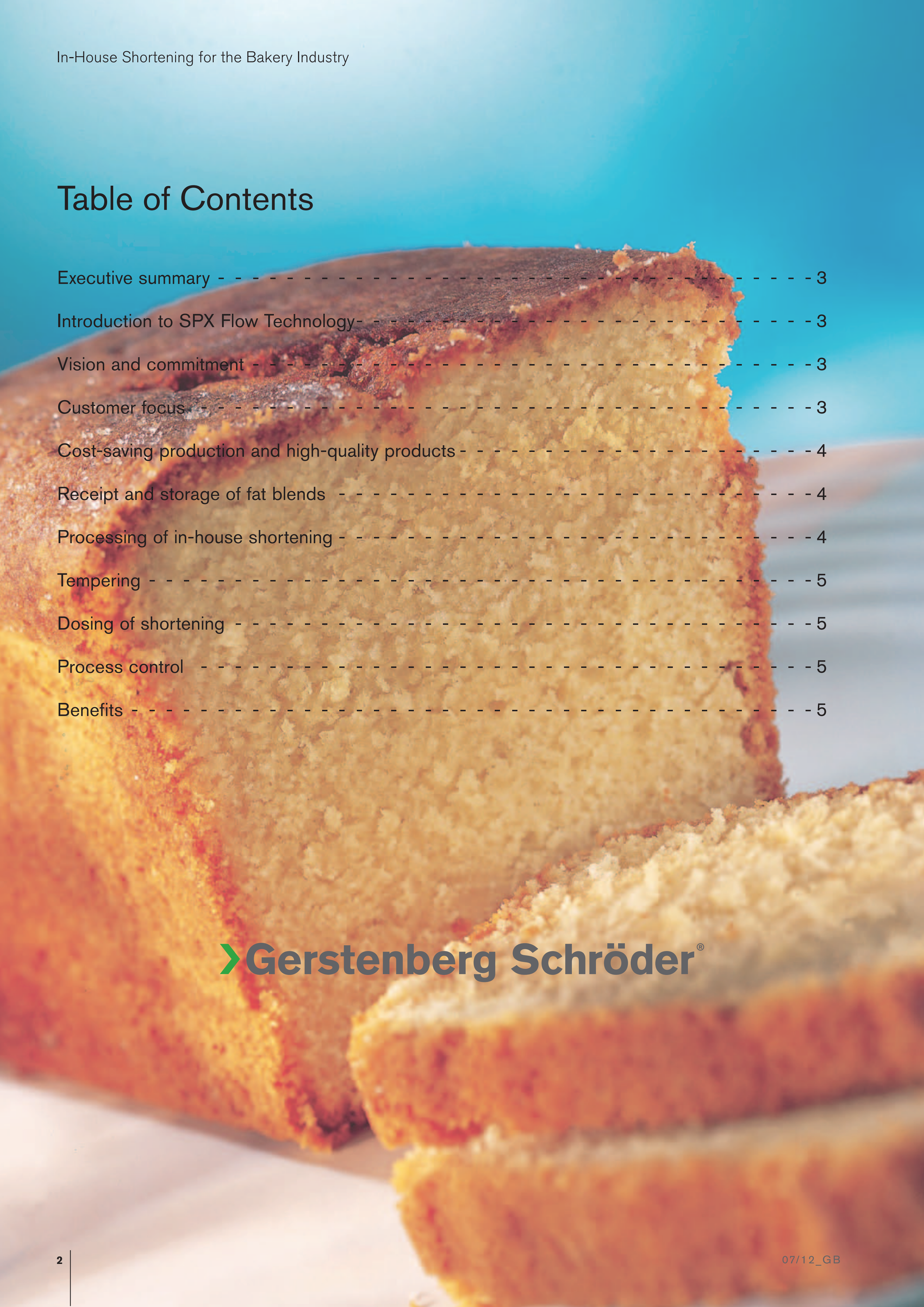


EXECUTIVE SUMMARY

Food companies today are like other manufacturing businesses not only focusing on the reliability and quality of the food processing equipment but also on various services which the supplier of the processing equipment can deliver. Apart from the efficient processing lines we deliver, we can be a partner from the initial idea or project stage to the final commissioning phase, not to forget the important after-market service. SPX Flow Technology has Gerstenberg Schröder installations in more than 110 countries around the world.

INTRODUCTION TO SPX FLOW TECHNOLOGY

VISION AND COMMITMENT

SPX's Flow Technology segment designs, manufactures and markets process engineering and automation solutions to the dairy, food, beverage, marine, pharmaceutical and personal care industries through its global operations.

We are committed to helping our customers all over the world to improve the performance and profitability of their manufacturing plant and processes. We achieve this by offering a wide range of products and solutions from engineered components to design of complete process plants supported by world-leading applications and development expertise.

We continue to help our customers optimize the performance and profitability of their plant throughout its service life with support services tailored to their individual needs through a coordinated customer service and spare parts network.

CUSTOMER FOCUS

SPX Flow Technology develops, manufactures and installs modern, high efficient and reliable processing lines for the food industry. For the production of crystallized fat products like margarine, butter, spreads and shortenings SPX offers Gerstenberg Schröder solutions which also comprise process lines for emulsified food products such as mayonnaise, sauces and dressings.

COST-SAVING PRODUCTION AND HIGH-QUALITY PRODUCTS

Today the bakery industry typically uses crystallized products such as margarine and shortening for the baked goods. These fats are normally delivered to the bakeries in the crystallized form filled into bag-in-boxes and on pallets. However, this form of distribution can be very costly for the factories due to a considerably large amount of handling as described below, not only for the bakeries but also for the producer of the crystallized products.

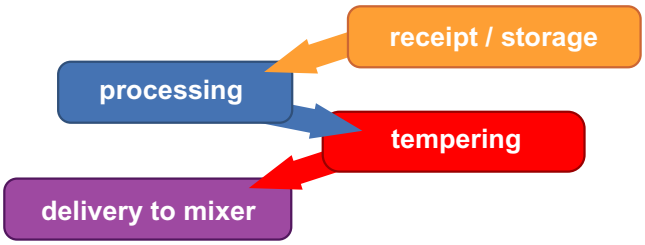
In a margarine factory:

manufacture of bags, manufacture of boxes, placing of bags in boxes, filling of boxes, closing of bags, closing of boxes, pelletizing, shrinking and wrapping, warehousing and transportation.

In a bakery factory:

truck unloading, warehousing, delivery to production, tempering, removal from boxes, removal of plastic bags, weighing of fats, feeding of mixer, disposal of waste, etc.

We offer complete compact in-house shortening plants for the bakery industry to produce shortening on site. The in-house process of shortening can be divided into four main areas:

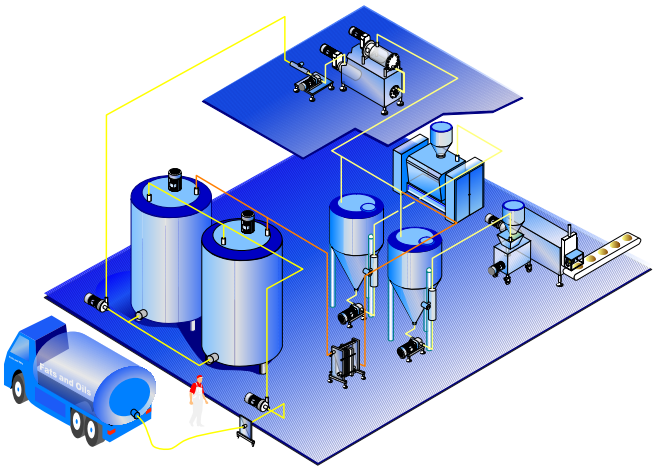


RECEIPT AND STORAGE OF FAT BLENDS

The fat blends consisting of several blends of oils and fats are delivered in bulk either by truck or by rail. These bulk deliveries are transferred into the heated storage tanks via a centrifugal pump. The temperature of these tanks should be kept at about 5°C above the melting point of the fat blend by means of a hot water jacket or a coil in the tanks.

PROCESSING OF IN-HOUSE SHORTENING

A pump transfers the fat blends from the storage tanks to the gear pump aggregate where the product flow rate is measured by a mass flowmeter. Nitrogen or any inert clean dry gas (usual ratio: 5-15%) may be injected into the product stream, either on the suction or pressure side of the pump. The product is then passed through the scraped surface heat exchanger (SSHE) in which the melted fat blend is shock-cooled and crystallized on the inner surface of the chilling tube. The crystallized fat blend is efficiently scraped off by the rotating scrapers, thus the fat blend is chilled and kneaded simultaneously. When the fat crystallizes, the fat crystals form a three-dimensional network entrapping the liquid oil, resulting in products with properties of plastic semi-solid nature.



Example of an in-house shortening process

After the product has been chilled in the SSHE it enters the pin rotor machine in which it is kneaded for a certain period of time and with a certain intensity in order to promote formation of the three-dimensional network, which on the macroscopic level relates to the structure or the consistency of the final shortening.

Before the shortening is filled into the maturing fat silos it passes through a homogenization arrangement which ensures an even distribution of the added gas in the shortening.

In case of a production stop further downstream, the product is transferred through a plate heat exchanger for remelting and is then returned to the storage tanks.

TEMPERING

In the fat silos the product is tempered for 2-4 hours for final maturation of the crystal structure. The silos are jacketed for tempering and pressurised with compressed air or nitrogen in order to press the product to the pump, hereby following the first-in-first-out process principle.

DOSING OF SHORTENING

The shortening is fed to the various continuous or batch mixers in the bakery by a lobe or gear type pump which applies low shear to the shortening. The flow is controlled by a straight tube mass flowmeter. In many cases the required mixing time for shortening into the dough may be reduced compared to the traditional bag-in-box product. The process and hereby texture is controlled in-house in the bakery. The quantity of the shortening and the filling time are parameters which are set in the recipe of the matching dough mixer. It is possible to dose up to 50 kg/min with an accuracy of 0.15%.

PROCESS CONTROL

The GS Logic process control system can control, monitor, visualize and record the complete production process according to most diverse recipes and parameters. The start-stop of the in-house shortening production will be initiated full-automatically by the content level of the silo fat tank and this can be controlled by the GS Logic system. This guarantees constant and reproducible high product quality with pre-set and controlled properties using a minimum of staff.

The following standard sizes are available for in-house shortening production:

PLANT CAPACITY	1,200 KG/H	2,250 KG/H	2,800 KG/H	4,200 KG/H
MACHINE TYPE	GS PERFECTOR 1X125	GS PERFECTOR 1X180	GS KOMBINATOR 250S	KOMBINATOR 250L
BULK TANK SIZE	30,000 L	45,000 L	45,000 L	45,000 L

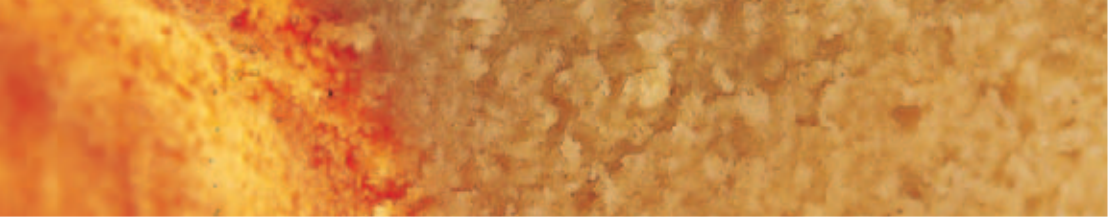
The capacity of the crystallization line is determined by the cooling surface available in the SSHE. Different machine sizes are available ranging from low to high capacity lines. Also various degrees of flexibility are available from single-tube equipment to multiple-tube lines, thus highly flexible processing lines.

This solution with the Gerstenberg Schröder brands makes it possible to produce shortening continuously with a constant high quality within a very short period of time and minimal investment and production costs.

GS Kombinator 250

BENEFITS

- Improved baking quality due to consistent shortening results.
- Increased production capacity due to reduced time requirement for mixing the shortening into the product.
- Highest hygienic standard and reduced product contamination to a minimum by producing in a closed system.
- Internal quality control of all raw materials due to control of the shortening process.
- No need for warehouse space for storage of boxed shortening.
- Reduced risk of injury due to minimal human involvement in handling.
- Labor savings due to less manual handling and full-automatic start-stop functionality with the GS Logic system.



SPX®

ABOUT SPX

Based in Charlotte, North Carolina, SPX Corporation (NYSE: SPW) is a global Fortune 500 multi-industry manufacturing leader

For more information, please visit www.spx.com.

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