

PROCESSING OF NATURAL FIBERS INCLUDING KENAF, FLAX, AND HEMP FOR NONWOVENS

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Abstract

Temafa GmbH and Charle & Co. Have developed jointly the lin line, a mechanical preparation system for processing natural fibers such as kenaf, flax, hemp, oil-seed flax, nettle and jute.

Introduction

Temafa GmbH is represented in the USA by Louis P. Batson Co. Batson represents a number of companies for sales and marketing in the US, Canada, and Mexico. Batson has been in business for 53 years.

Equipment

Temafa GmbH has more that 120 years experience in the production of fiber opening, fiber cleaning and fiber blending systems. Charle & Co. have been working on the sector of flax straw and scutcher tow preparation for 50 years.

They have jointly developed the Lin Line, a mechanical preparation system for processing natural fibers (kenaf, flax, hemp, oil-seed flax, nettle and jute).

According to the demands made on the final product, flexible system concepts ensure the production of raw material for various fields of the nonwoven sector (nonwoven fabrics, composites, cellulose/paper industry) or short fibers for spinning mills (also in blends with other fibers).

The Lin Line comprises the following steps of treatment:

Straw Preparation Line

According to the quality of the input material the capacity of the preparation line comes to a maximum of 2 tons/hour. The material is fed into the system via a feed table (1) which also serves as a material buffer. The Lin-Bale Opener (2) is able to treat round as well as rectangular bales. It is equipped with an integrated grid for the separation of stones. After the Lin-Bale Opener there is a conveyor belt (3) with an integrated metal detector to locate and automatically separate metal parts. The purpose of the Lin-Breaker (4) is to treat flax straw, kenaf, or hemp straw such that the wooden elements are bruised many times without altering the fiber structure. Intensive bruising is important for the separation of shives. The Lin-Pedal Shaker (5) serves for the removal of the wooden elements (shives) released by the Lin-Breaker.

Fiber Cleaning Line

The Lin-Cleaner (6) removes the shives. Lin-Comb Shakers (7) separate loose shives after the Lin-Cleaner. The number of Lin-Cleaners and shakers is variable and depends on the requested fiber cleaning degree and on the fiber fineness.

Fiber Opening Line

By the fiber material passing various opening stages connected in series (Lin-Opener (8), Lin-Star fine opening (9), Lin-Star cottonizing (10)), the fiber fineness and length may be adapted in variable steps as far as required for the final product. Thus, the system meets the greatest demands concerning the fiber quality.

Shive Cleaning Installation Duvex

Essentially, the economy of a preparation system is given through the additional use and marketing of the by-products that are generated, such as shives, seeds, short fibers and dust. Especially the use of shives for horse beddings, cat litter and chip-boards has become very popular.

With the Duvex System the Lin Line offers a complete solution. All residues are transported to a central point and separated there. Afterwards each individual component may be used as required.

Periphery

Beside the preparation lines described above, the following machines are part of a complete fiber preparation line:

1. Bale press, filtering system, straw drier
2. Mixmaster to homogenize the prepared fibers
3. On-line technique for blending the bast fibers with PP fibers or others and afterwards material supply to nonwoven systems.

These are used optionally to Temafa's standard production range.

The Lin Line is characterized by:

1. The optimum yield of fibers
2. A very high degree of total purification of the fiber material
3. The high production capacity

To realize the Lin Line system, we need to know the following details:

1. The raw material to be treated
2. The required input / output capacity
3. The requested fiber parameters for the final product

With the Lin Line system Temafa offers a global technology in view of the complex topic of the preparation of various growing natural fibers. From fiber preparation and fiber blending to the feeding of web forming machines we realize modular standard systems as well as user-oriented special solutions.