

Putsch<sup>®</sup> candle filters have been standard equipment in the sugar industry worldwide for decades.

The filters are used successfully in sugar beet factories as well as in sugar refineries. Application in sugar cane factories is also possible.

These low pressure filter systems are particularly suitable for thickening of slurries with low to moderate solid contents, for safety filtration and for syrup filtration.

Putsch<sup>®</sup> High Performance Candle Filters (HKF) are discontinuously working filters with back flush.

#### Areas of Application: In beet sugar factories:

- for filtration of carbonated juice after the first and the second carbonation
- · as safety filters for thin juice
- for fine filtration of syrups with the addition of filter aids

#### In refineries:

 for thickening of carbonated clarified liquor

### Advantages of candle filters:

- programmable control ensures fully automated operation
- thickening rate is individually adjustable (depending on application up to 650 g/l)
- no additional energy required for cleaning
- · durable equipment
- sturdy filter elements
- high specific throughput rate because of short cycle times
- quick exchange of complete intermediate bottom complete with filter candles if needed
- CIP (cleaning in place) of filter cloths in closed candle filter to extend cycle times before exchange (option).

The special space saving Putsch<sup>®</sup> filter cover construction allows the economical, quick and safe stacking of the filter covers on top of nearby filters.

Putsch<sup>®</sup> uses different materials and weave patterns with various permeabilities for the filter cloths depending on the slurries to be filtered.

The necessary back flush filtrate is available in a separate head tank.

Cleaning of the filter material can be supported by applying air pressure or steam for difficult filtration processes. All electrical equipment is conceptualized and realized by Putsch<sup>®</sup>. Therefore, individual customer requests can be taken into account.

Putsch<sup>®</sup> filters are fully automated. A programmable controller controls the operation sequence. Depending on site conditions, several filters can be controlled from one control cabinet. Additional control units can also be installed on each filter, depending on the distance between the control cabinet and the filters.

To monitor the process, the filter control can be integrated in a central factory control system with the option of switching from automatic to manual operation.

r Level measurement f Return c Carbonated mud juice Acid cleaning in place Pre-filtrate

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Filtration and cleaning schematic of high performance candle filters (HKF) for carbonated mud juice 2 filtration and safety filtration.

# **Cleaning in place**

In Putsch<sup>®</sup> HKF clogged filter cloths can be cleaned directly inside the filter with the help of acid. This will be carried out automatically without any additional assembly work.

#### Function and Construction of Putsch<sup>®</sup> High Performance Candle Filter (HKF)

Putsch<sup>®</sup> High Performance Candle Filter HKF is a further developed candle filter. The goal of this development is to offer sugar factories a high performance filter type HKF, which will meet the raised expectations of filtration using proven and new components.

Main features of the Putsch<sup>®</sup> High Performance Candle Filters include:

- $\cdot$  a higher specific filter performance
- high solid contents in carbonated mud juice concentrate
- reliable cleaning of filter cloths through back flush filtrate
- · clear filtrate
- $\cdot$  filtration in the low pressure range
- quick and easy exchange of filter candles
- · cost efficient design

The material to be filtered is introduced through a central inlet (6) into the filter vessel (1). The solids collect on the filter candles (3), which are covered with filter cloths (5). The filtrate flows through the filter candles into the filtrate area to the head tank through a pipe (7).

Mud concentrate is removed through the conical bottom of the vessel (8).

The main dimensions of the new High Performance Candle Filter (HKF) are basically the same, allowing for easy replacement of old Candle Filters with the new type.



Candle filters (HKF) consist of the filter vessel (1), the intermediate bottom (2) with filter candles (3) and the filter cover (4). Up to 291 filter candles are installed in the pressurized filter vessel.

The constructional features of the Putsch<sup>®</sup> High Performance Candle Filters (HKF) are:

- The conical bottom is constructed at a 45° angle.
- Introduction of slurry occurs centrally up to 8" below the intermediate bottom.
- If a clearance of 2" between candles is selected, filter areas of 1130 sq.ft. or 2150 sq.ft. are available. A clearance of 2" can be utilized because this process forms thinner filter cake.
- During the filter cycle, partial cleaning can be accomplished.
- Cleaning of the filter candles occurs with filtrate back flush from an head tank.
- An acid-resistance coating allowes cleaning in place.

- 1 = Vessel
- 2 = Intermediate bottom
- 3 = Filter candle
- 4 = Filter cover
- 5 = Filter cloth
- 6 = Central inlet
- 7 = Filtrate outlet
- 8 = Conical shaped bottom
- 9 = Lifting eyes for filter cover
- 10 = Sealing ring
- 11 = Mud concentrate outlet
- 12 = Acid resistent coating

13 = Level measurement for cleaning in place

With the improved construction and operation features we achieve significantly higher filter performances.

Short filtration times result in thin filter cake on the filter candles. This ensures that filtration always takes place in the high throughput range of the filtration curve but with low filtration pressure.







### **Process Control**

An adapted filter control system ensures that a high solid content in carbonated mud concentrate is reached and prevents clogging of the Putsch<sup>®</sup> High Performance Candle Filters.

Monitoring of the filtration pressure ensures technical and technological optimum filtration. The filtrate outlet pipe (7) extends into the dome of the vessel cover (4) to improve the filtrate quality. The air contained in the filtrate is thus compressed in the dome of the filter. Pressure surges can thereby be equalized.

To achieve the highest filtrate quality, the High Performance Candle Filter (HKF) is equipped with a cloudy filtrate return. Filtration is completed when:

- · the preset slurry volume is filtered
- · the monitoring time has elapsed
- · the maximum filtration

pressure has been reached

At the end of the cycle the mud concentrate in the conical bottom (8) is emptied aided by back flush filtrate.

Subsequently the filter control will automatically switch to cleaning, ensuring the filters' full capacity performance again.

## Please contact us for additional information and spare part inquiries:

## Putsch<sup>®</sup> & Company, Inc.

Asheville, NC 28813-5128 Phone 828.684.0671 Toll free 800.847.8427 Fax 828.684.4894 Email info@putschusa.com **www.putschusa.com**