

# OAT PROCESSING PLANTS





# OVER 130 YEARS OF EXPERIENCE

in the processing of grain and pulses



The continuous development of machines and plants makes SCHULE Mühlenbau a competent partner when it comes to processing rice, grain, legumes and much more.

Processing oats requires many different production steps. Besides cleaning and sorting, this also includes hulling and flaking. SCHULE manufactures all the machines required for oat processing at its central factory in Reinbek near Hamburg, which is certified according to DIN EN ISO 9001. So they are "Made in Germany". Since 1892, SCHULE Mühlenbau has been well acquainted with all grain-producing countries in the world and with the corresponding processing methods. The patent 77,786 for the internationally known table separator made the inventor Friedrich Hermann Schule and his company of the same name well-known at an early stage. Since that time, the SCHULE table separator has been the best-selling machine in the entire product portfolio.



Oats are one of the healthiest and most nutritious cereals with a high content of vitamins, minerals and soluble fibre.



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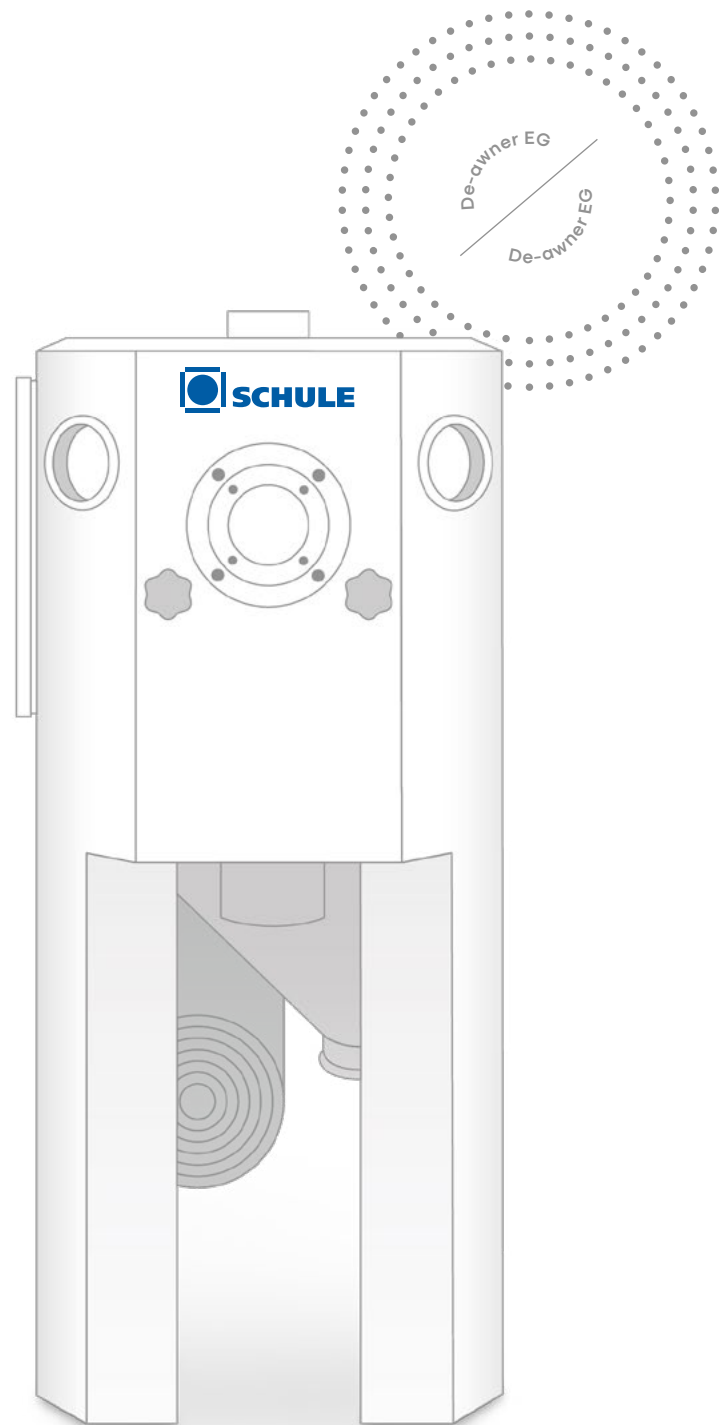
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# DE-AWNER

For loosening husks and removing double grains in preparation for husking.



## Advantages

- Operating method ensuring gentle product treatment
- Various setting options during operation
- Easy to operate and monitor

With its specially designed rotor, the de-awner loosens the husk around the oat kernel. This results in a gentler husking process, whereby the highest degree of husking is reached with the least percentage of broken grains. This reduces the load on the downstream machines and thus ensures the highest yields.



↑ Raw material upstream of de-awner



↑ Final product downstream of de-awner



# IMPACT HULLER

By means of SCHULE hulling machines, the previously cleaned and, if necessary, graded product is optimally hulled in a wide variety of processes.



## Advantages

- High hulling degree with low percentage of broken grains
- Continuously adjustable speed range
- Long impact ring service life due to highly wear-resistant material and automatic impact ring adjustment
- Short maintenance times due to specially designed impact ring holder

Hulling is a decisive process step in an oat processing plant. The SCHULE impact huller is one of the main machines in this process and is used to hull for example oats, sunflower seeds, spelt and hemp.



↑ Mixture of hulled and unhulled kernels as well as hulls downstream of the impact huller



# OAT POLISHER

By gently acting on the grain surface, the so-called oat fluff can be removed.



## Advantages

- Gentle product processing thanks to a special rotor and suitable screen elements
- Different polishing intensities can be set without any problems
- Easy to monitor and operate

The SCHULE oat polisher is used to remove the fine hairs, the so-called fluff, surrounding the oat grain as gently and completely as possible. The removal of the oat fluff is necessary to reduce cleaning work caused by malfunctions and thus to increase plant availability. In addition, the removal of the hairs ensures a better mouthfeel and thus a better sensory quality of the finished products.



↑ Oat kernels downstream of the oat polisher

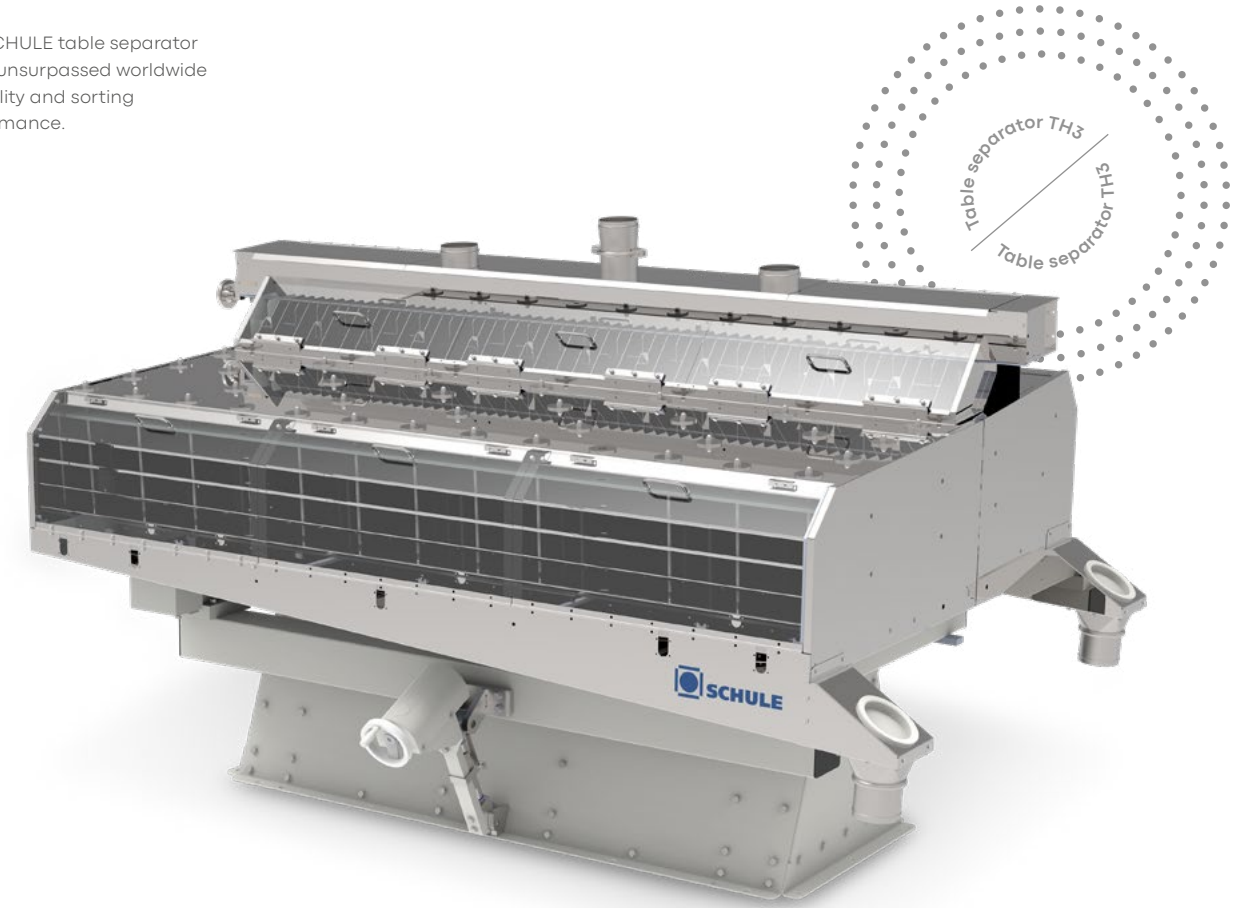


# TABLE SEPARATOR

Over 130 years of experience for best sorting results and highest precision of separation.



The SCHULE table separator is still unsurpassed worldwide in quality and sorting performance.



## Advantages

- Precise sorting
- Easy to maintain and operate
- Supporting aspiration through two aspiration connections in the inlet area
- Durable machine due to the sturdy design

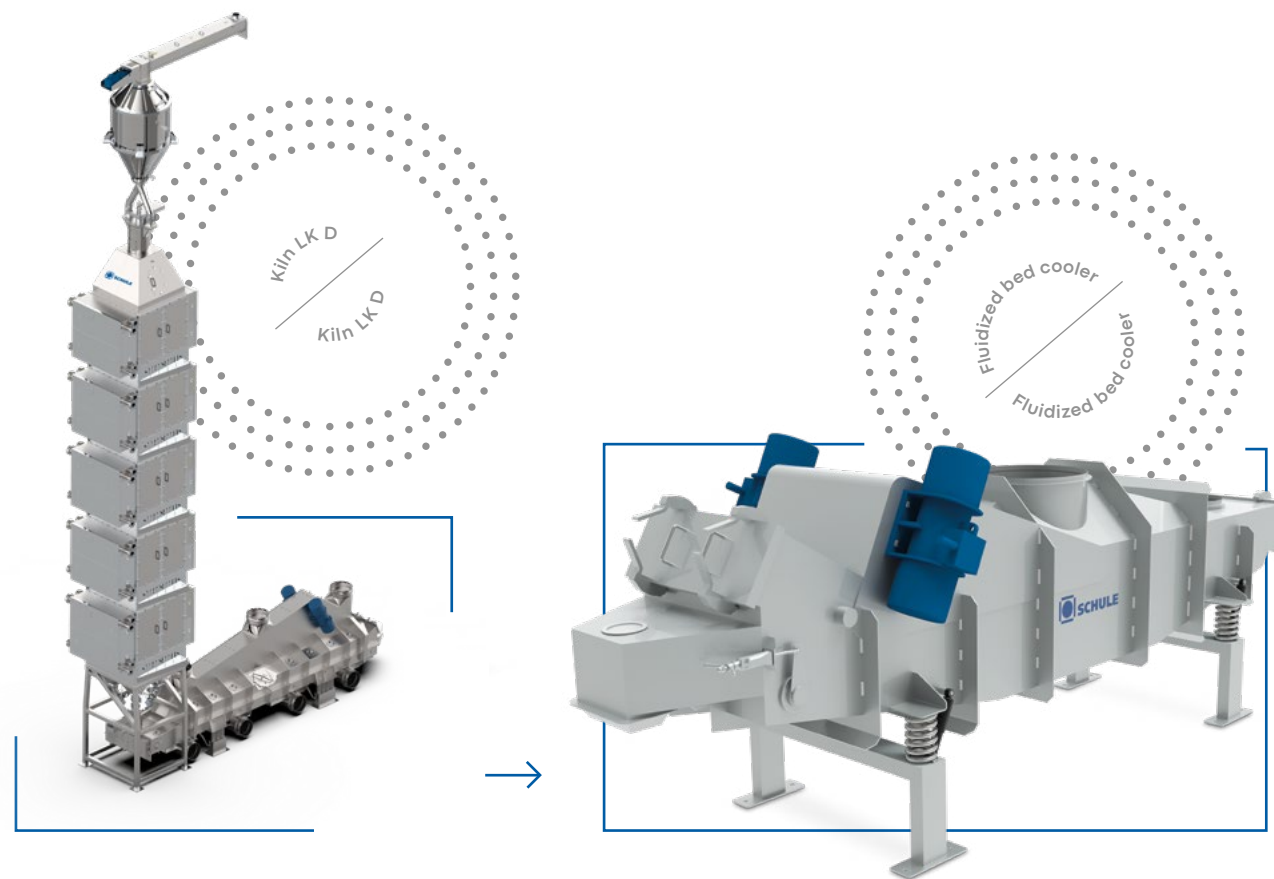
A homogeneous product has a positive effect on the subsequent process. The table separator separates hulled from unhulled oat kernels via specially arranged sorting chambers. This high-precision sorting reduces returns, avoids broken grains and thus increases throughput and yield in production.





# KILN AND FLUIDIZED BED COOLER

Hydrothermal processes are used to produce stabilised raw oats or kiln-dried oat kernels.



## Advantages

- Increased shelf life of the product
- Refinement of the taste
- By decoupling the heating and cooling zones:
  - Reduction of the overall height
  - No heat losses (higher efficiency)

The SCHULE kiln is used to stabilise the oats. Since oats have a relatively high fat content compared to other cereals, which is distributed throughout the grain, the fat-splitting enzymes must be inactivated with the help of the kiln. On the one hand, this ensures the product's shelf life and, on the other, gives the oats a nutty or roasted aroma. Basically, it is possible to dry the hulled oat kernels or the still unhulled raw oats.



↑ Kiln-dried oat kernels



# COLOUR SORTING MACHINE

Removal of products with visual defects such as impurities, foreign grain, broken grain as well as discoloured and unhulled oat kernels.



## Advantages

- Precise high-performance cameras detect the slightest defects on the oat grain
- The specially designed ejector nozzles ensure maximum capacities with minimum product loss
- Precise exclusion of impurities, foreign grains, seeds, broken grains and unhulled oats
- Special application programmes for ensuring gluten-free products possible

With SCHULE colour sorting machines it is possible to store up to 600 sorting programmes. This makes it possible to sort other, similar products as well. The set parameters are automatically and reliably maintained by the colour sorting machines during the entire production period.



↑ Cleaned oat kernels downstream of the colour sorting machine



# DRUM GROAT CUTTER

Baby flakes and tender leaf flakes can only be made from cut grains, the so-called groats.



## Advantages

- Most powerful machine with a small footprint
- Reduced maintenance costs due to quick change of knives and drums
- Minimum amount of cutting flour due to laser-cut precision knife basket without shims
- Precise cutting pattern for consistent product quality

The SCHULE drum groat cutter is the perfect choice when it comes to the production of groated grain and this has to be done homogeneously with little cutting flour and the world's most powerful machine.

Via a continuously adjustable vibration channel, the oat kernels are fed into the perforated drums made of special steel. Calibrated holes guide the product to the precision knife basket without shims, producing uniformly cut groats.



↑ Oat groats



# FLAKING ROLLER MILL

After hydrothermal treatment, the steamed and heated kernels are flaked.



## Advantages

- Robust and durable design of the flaking rollers
- Vibration-free operation due to special roller bearings and shock absorbers
- Quick and easy to maintain
- More efficient cleaning of the rollers due to hydraulically adjustable scrapers
- Automatic starting and stopping systems as well as automatic roller gap adjustment possible

To produce flakes, the flaking roller mill is needed in addition to an upstream steamer and a tempering bin. It transforms the steamed kernels or the steamed groats into the desired flake shape. Depending on the requirements, the desired flake thickness can be continuously adjusted.



↑ Jumbo oat flakes



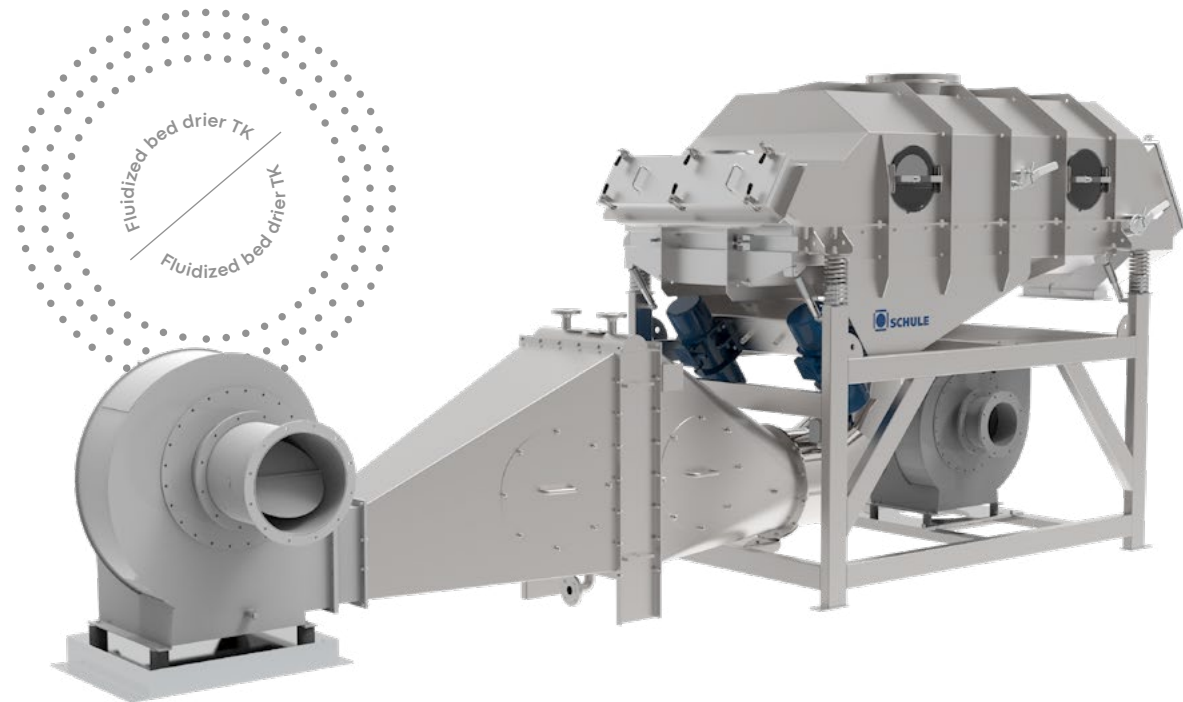
↑ Baby oat flakes





# FLUIDIZED BED DRIER/COOLER

After flaking the product, the desired final moisture content and product temperature are reached by uniform drying and cooling.



## Advantages

- Gentle product treatment
- Sturdy design
- Easy to clean and maintain due to large inspection openings

The SCHULE fluidized bed drier/cooler is used for gentle drying and cooling of cereals, flakes and legumes. It is made of stainless steel, specifically for the requirements of the food industry.



↑ Baby oat flakes



# REFERENCES

Plant for the production of gluten-free oats

## Reference plant



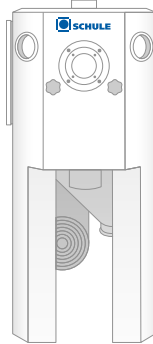
↑ Oat plant of the company Bauck



# TECHNICAL DATA

Extract from the oat processing portfolio

De-awner	EG
Capacity t/h	up to 15.0
Motor power kW	up to 18.5
Aspiration m <sup>3</sup> /min	up to 40.0



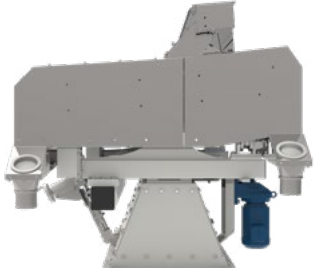
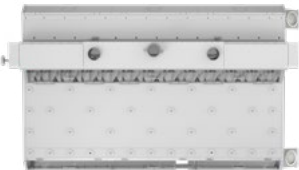
Impact huller	FKS CL
Capacity t/h	up to 5.0
Motor power kW	5.5
Aspiration m <sup>3</sup> /min	-



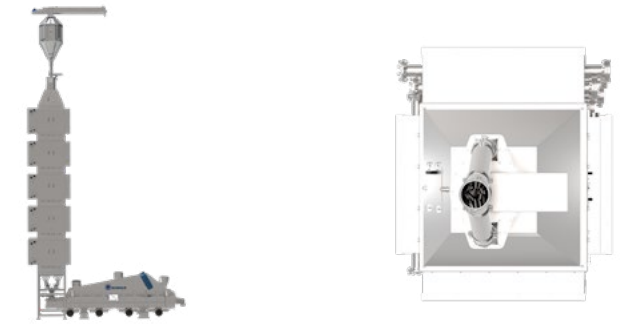

Oat polisher	PM H
Capacity t/h	up to 7.5
Motor power kW	up to 22
Aspiration m <sup>3</sup> /min	50




Table separator	TH3
Capacity t/h	up to 4,000
No. of compartments	up to 60
Motor power kW	3
Aspiration m <sup>3</sup> /min	20


Kiln	LK D
Capacity raw oats t/h	up to 11.0
Capacity oat kernels (t/h)	up to 14.0



Colour sorting machine	FS
Capacity t/h	up to 21.0
Motor power kW	3.5
Aspiration m <sup>3</sup> /min	30.0
Compressed air l/s	55.0



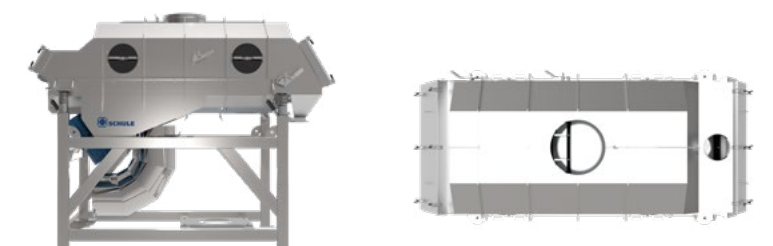
Drum groat cutter	TGS
Capacity t/h	up to 2.0
Motor power kW	1.1/0.25
Aspiration m <sup>3</sup> /min	10.0



Flaking roller mill	WS F
Capacity t/h	up to 6.0
Motor power kW	2×30/0.75
Aspiration m <sup>3</sup> /min	30.0
Roller diameter mm	600
Roller length mm	up to 1300



Fluidized bed drier/cooler	FS
Capacity t/h	up to 5.0
Motor power kW	2.0
Aspiration m <sup>3</sup> /min	up to 375.0

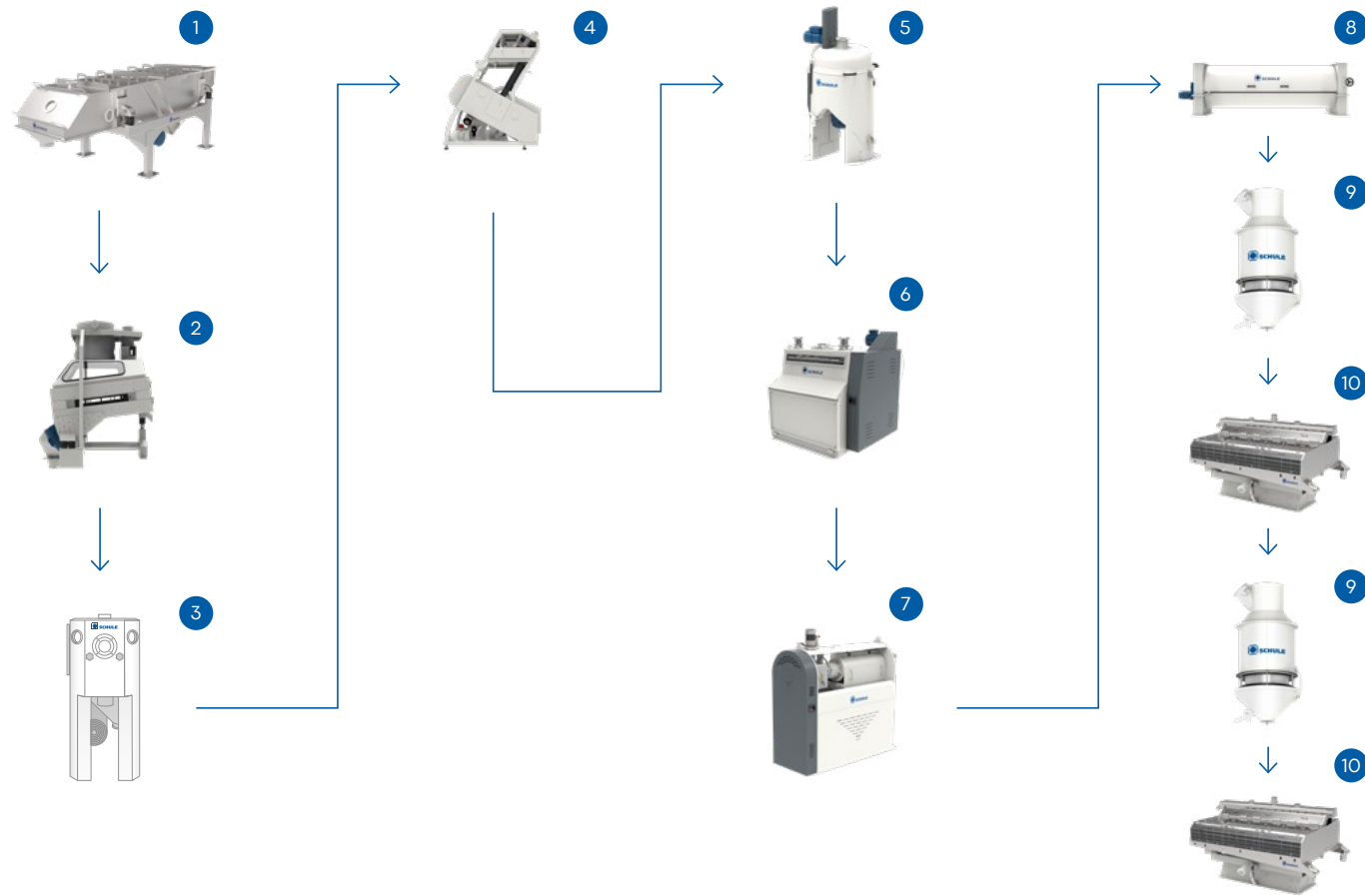






# PLANT EXTRACT

for oat processing

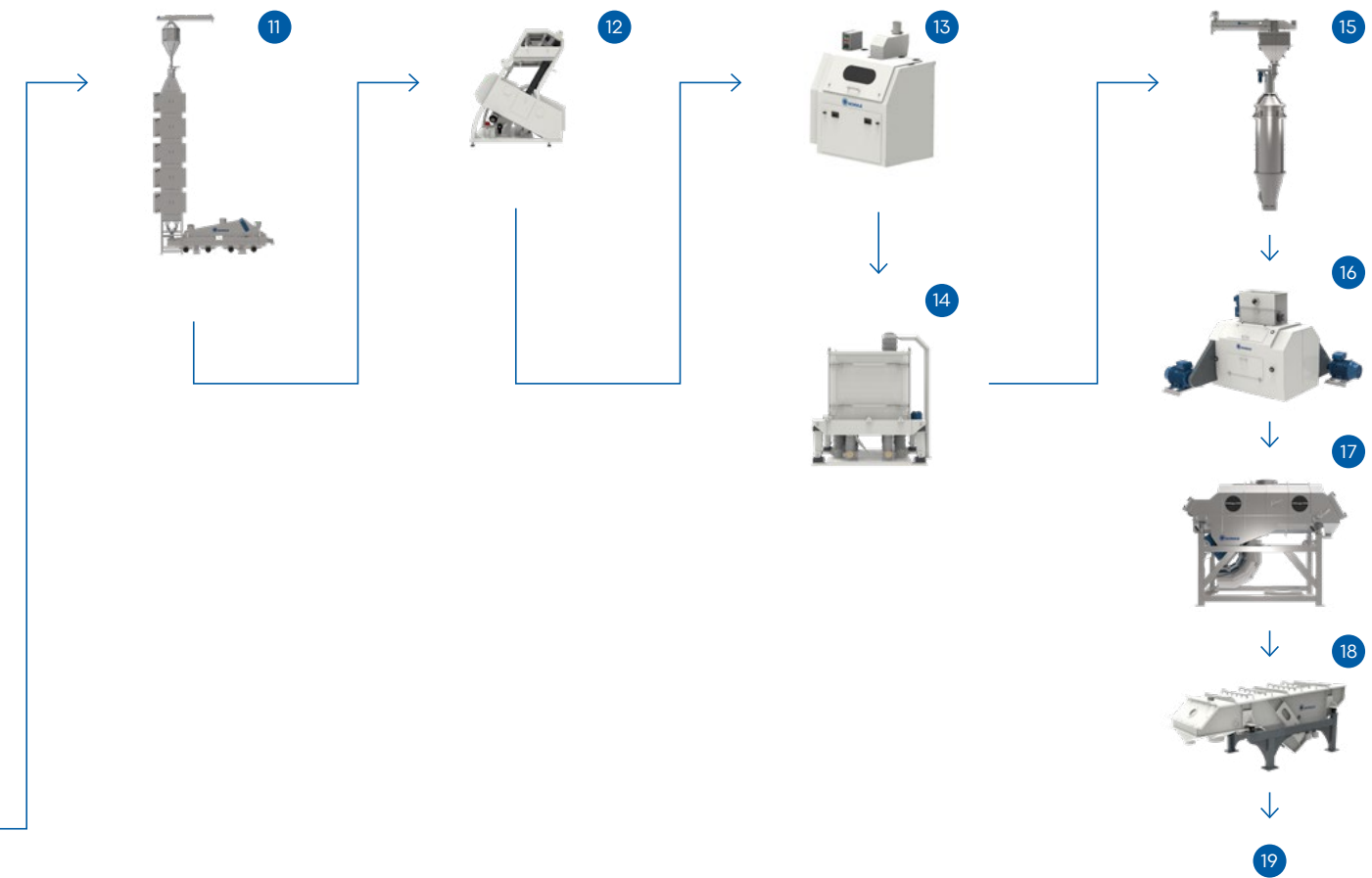


- 1 Circular vibrating screen
- 2 Destoner
- 3 De-awner
- 4 Colour sorting machine
- 5 Impact huller

- 6 Closed circuit husk separator
- 7 Oat polisher
- 8 Indented cylinder
- 9 Counter-current coarse sifter
- 10 Table separator

- 11 Moistening screw, kiln and cooling unit
- 12 Colour sorting machine
- 13 Drum groat cutter
- 14 Plansifter
- 15 Moistening screw, steamer and tempering zone

- 16 Flaking roller mill
- 17 Fluidized bed drier / cooler
- 18 Flake control screen
- 19 Finished product



↑ Finished product: Oat flakes









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