

Phidan Engineering ApS



TBS COMBI

Phidan *Ballistic Separator*





TBS COMBI

TBS COMBI is a mobile sorting machine with integrated feeding, sorting and output of sorted waste on a conveyor belt. The machine sorts the waste into three different fractions:

1. 3D fraction: Hard plastic, Glass, Metal, Tetra Pak, Cardboard etc.
2. 2D fraction: Soft plastic, Foil, Paper, Textiles etc.
3. Sieve fraction*: Waste sorted through a sieve: Stone, Sand, Dust, Organic waste etc. *Sieve size is made according to requirements.

Feeding system where the waste is loaded into the feeding box, and from here is fed onto the sorting table. The feeding system is chain-driven and the capacity is controlled with a frequency converter.

Sorting table consisting of 9 separator plates with a length of 4 meters. The plates are designed with both carriers and sieves, which can be designed according to customer needs and the shape of the waste.

Hydraulic system with handle for folding the conveyor belt, adjusting the angle of the sorting table, and activating the wheel system for transport.

TBS Combi	
Capacity*	≈ 12 tons/time
Efficiency**	≈ 95 %
Total power input	27 kW
Total width	2,5 m
Total length	6 m
Total height	3 m
Total weight	3,8 tons
Infeed volume	Op til 10 m ³
Conveyor belt	3 pcs. foldable
Fans	3 pcs.

* Capacity is indicative and depends on material etc.

** Efficiency depends on material etc.





TBS COMBI – Feeding system

The automatic feeding system delivers a continuous waste flow to the sorting table. The waste can be loaded into the feeding box with a conventional loader and a removable loading frame can be supplied on the top of the box for efficient handling. The waste is fed by carriers mounted on a powerful chain drive. The feeding capacity can be regulated with a frequency converter and can be adapted to the individual waste types for optimal feeding. The feeding system contains a bag opener system to open closed bags, which simultaneously distributes the waste across the entire sorting table.



TBS Combi – Feeding system

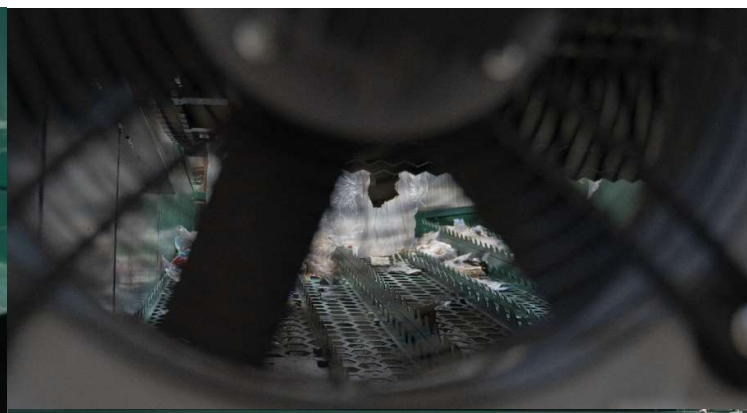
Feeding volume	Max 10 m ³
Feeding height	2,8 m
Feeding opening	400 X 1800 mm
Power input	2.2 kW
Max speed	20 rpm
Speed control	Frequency controlled
Other	Reversible operation Bag opening system





TBS COMBI – SORTING TABLE & FAN

The sorting table is made up of 9 separator plates, which are driven by two cranks. Each separator plate is made up of three replaceable plate sections that can be designed with individual carriers and sieves. The inclination and eccentric movement of the plates provide efficient sorting of 2D and 3D items. Both the speed and the inclination of the sorting table can be adjusted as needed. To increase both efficiency and capacity, three frequency-controlled fans have been installed, which can be adjusted depending on the combination of waste. For example, waste with a high foil content will need a large air volume, while waste with a low foil content only needs a low air volume. The screen in the separator plates is laser cut and can be designed in both shape and size according to customer needs. In the pictures below the screen is hexagonal 50 mm holes.



TBS Combi – SORTING TABLE & FAN

Power supplied sorting table	18,5 kW
Power supplied fan	3 x 0,55 kW
Number of plates	9 pcs.
Plate dimensions	4000 x 230 mm
Max speed	180 rpm
Speed control	Frequency controlled
Other	Hydraulic Angle adjustment





TBS COMBI – Belt, wheel system & Hook lift

The sorting machine is equipped with a number of systems to make the sorting process easier and more accessible. Integrated into the machine, three foldable conveyor belts are installed to handle outputs from the 3 fractions. The folding mechanism is hydraulically controlled and is fitted with adjustable end stops so that the same unloading angle is achieved every time. The machine has a wheel system that allows the sorting machine to be transported internally on site. This is activated hydraulically and has a mechanical lock so that the hydraulics can be disconnected during transport. A hook lift must be used to pull the machine on its wheels.



TBS Combi – Conveyor belt

Power supplied	3 x 1.1kW
Belt width	2 x 600 mm 1 x 900 mm
Other	Drivers Hydraulic folding Lateral control of the belt





TBS COMBI – OPERATING COSTS

	Beskrivelse	DKK pr. time	DKK pr. ton	Total kost Acc. DKK pr. ton
Power input	Sorting table ≈ 18kW	34.5	3.45	3.45
	Conveyor belt ≈ 3 kW			
	Feeding ≈ 2 kW			
Wear parts	Belt ≈ 8 DKK/hour	11.5	1.2	4.6
	Misc. ≈ 3.5 DKK/hour			
Daily service	30 minutes per day	28	2.8	7.4
Operator incl. loader	Internal cost	450	45	52.4
CAPEX	Depreciation over 6 years @ 5%	70	4.7	57.1

- Example with 10 tons/hour of household collected plastic waste
- 25000 tons/year = 2500 hours/year = 8 hours/day

