

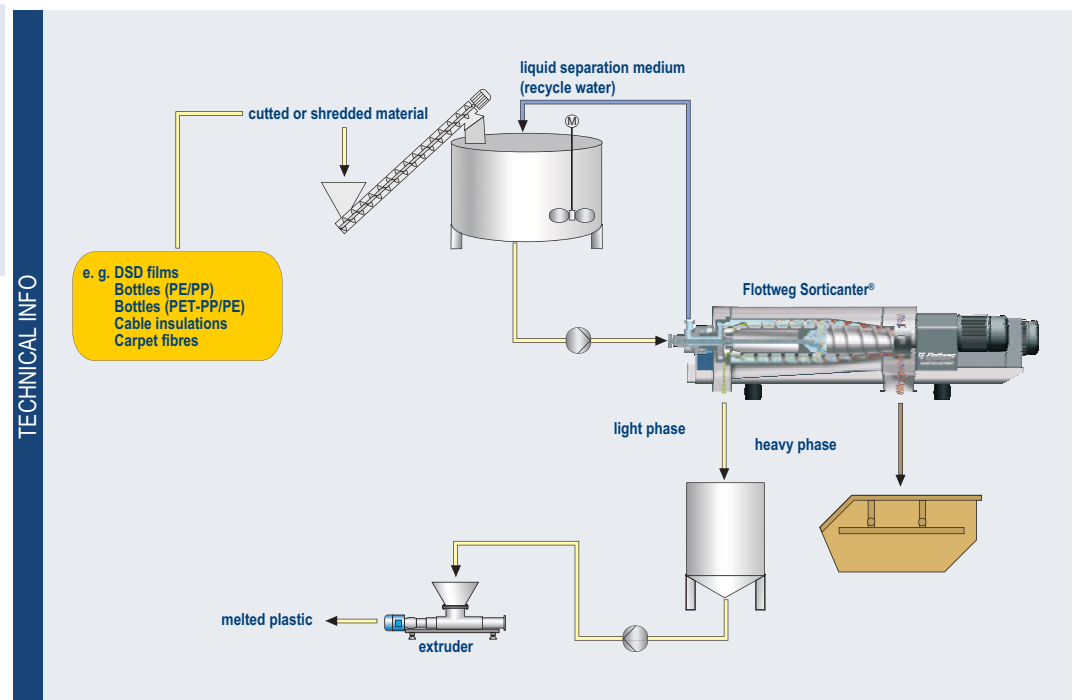
FLOTTWEG SORTICANTER®
Innovative Centrifuge Technology
for Plastics Recycling



WASTE BECOMES A RESOURCE

When recycling light-weight packaging, plastic fibers, and plastics waste from industrial production for reuse or combustion, the purity of the recycled materials is critical. Since many plastics differ in their density, sorting by means of a sink or swim procedure is an efficient method of separation. The easiest method is static separation in a tank. A separation liquid is chosen that has a density which lies between the densities of the plastics to be separated. As a result, the lighter material concentrates at the surface whereas the heavier material settles to the bottom.

Static separation in a tank is driven by gravity, at a force of one g. In contrast to this procedure, separation is much faster when replacing gravity by centrifugal force. That means sorting with the help of a centrifuge is much quicker and the sorted plastic fractions are much dryer than when separating by gravity in a tank. Air bubbles and other surface effects do not influence separation, which also allows for washing dust away from the surface of the plastics.



Plastics recycling

Efficient waste separation is a prerequisite for successful recycling

SORTING WITH 1600 X G

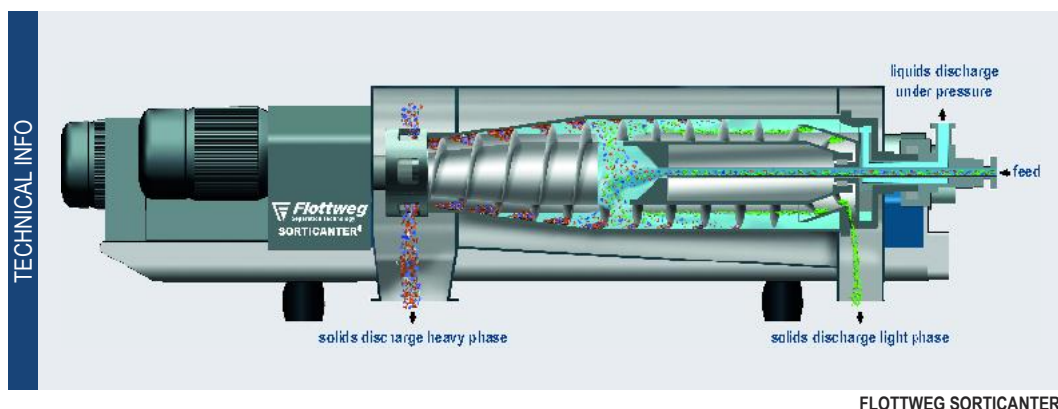
How the FLOTTWEG SORTICANTER® Works

Before the sorting process, the raw material is shredded to a particle size between 2 and 16 mm, and then washed of adhering impurities (e.g. paper labels). The shredded and pre-cleaned material is then mixed with the carrier liquid, which is also called a liquid separation medium, in specially developed homogenization tanks. Next, the homogenized suspension is fed via a static feed pipe into the rotating bowl of the FLOTTWEG SORTICANTER® where it is accelerated to the circumferential speed of the centrifuge bowl. Due to the centrifugal force, the heavier material is packed tightly against the bowl wall. The solids deposited here are conveyed by the scroll, which rotates inside the centrifuge rotor with a differential speed, to the conical end of the bowl (see picture below, on the left). The cake is transported at the cone out of the liquid. On the dry zone of the cone, the liquid separation medium is separated from the cake via centrifugal force. The dried cake is discharged as a heavy phase via ports in the bowl. The light phase concentrates on the surface of the liquid inside the bowl. The liquid flows out of the cylindrical end of the bowl (see picture below, on the right) picking up the individual plastic particles. The floating light phase is pulled away and the remaining heavy particles are freed and separated. Finally, the light phase arrives at a bell-shaped collection cone which is partly immersed in the liquid.

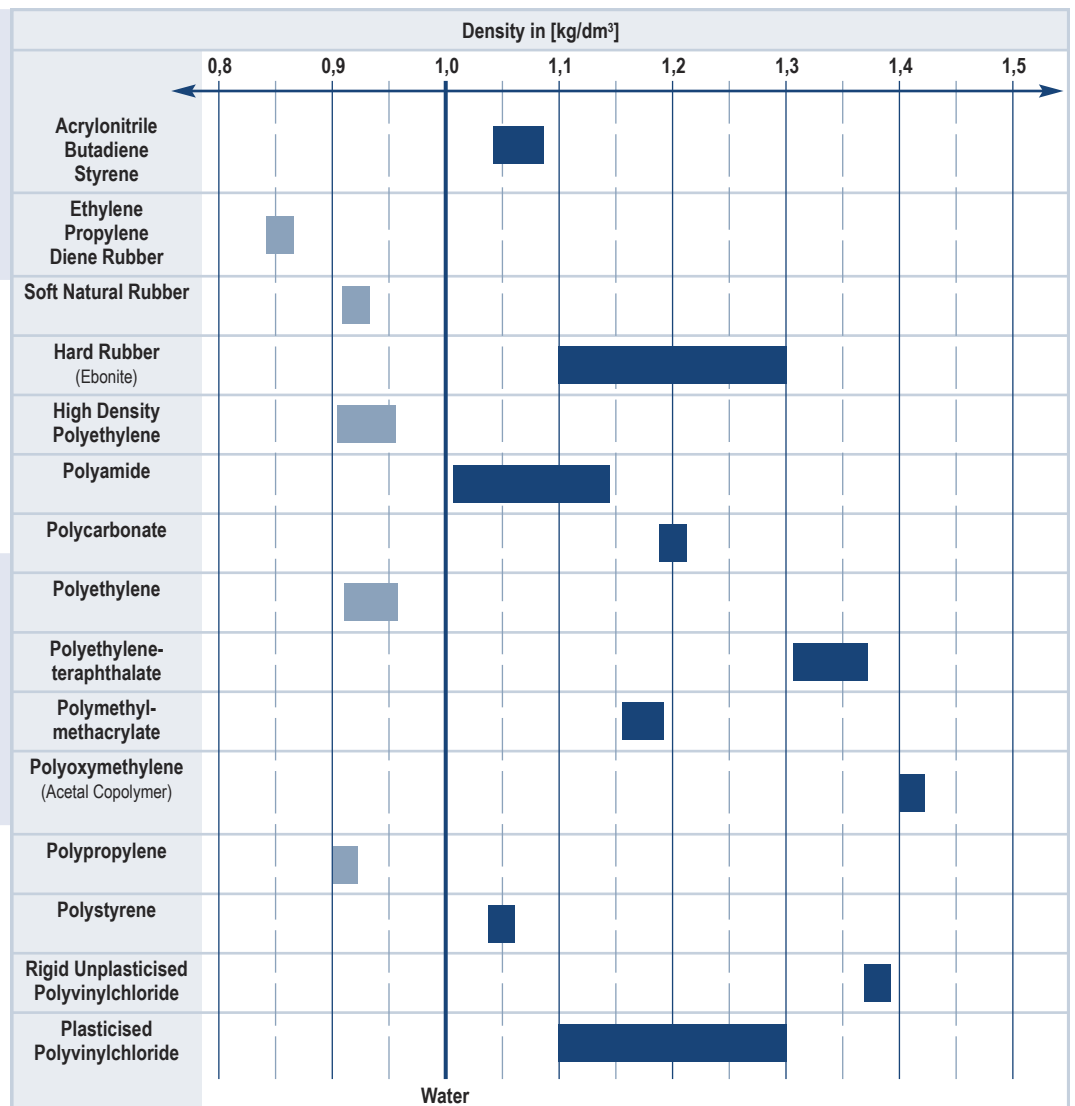
The flights of the scroll inside the collection cone have reverse pitch flights, which means that they convey the light fraction via the second cone toward the discharge for the light phase and opposite to the heavy solids discharge. During the passage of the solids through the dry zone, there is also centrifugal dewatering. The carrier liquid flows back and is then discharged via an impeller disc under pressure to be sent back to the mixing vessel.

The FLOTTWEG SORTICANTER® is not only used for plastics sorting but can also be utilized for other separation tasks in which light and heavy solids have to be separated, e.g. the contents of fat separators with solid fat as a light phase, compact impurities as a heavy phase and water as the liquid separation medium. A precondition for separation feasibility is a carrier liquid whose density lies between the densities of the fractions to be separated.

The FLOTTWEG SORTICANTER® is also suitable for separating purely settling from floating solids in a carrier liquid.



DENSITY OF PLASTICS



Advantages of the FLOTTWEG SORTICANTER® in comparison to other equipments

High separation efficiency

- Improved sorting accuracy
- Higher value of the final product
- Separation of substances which cannot be separated via static separation
- No additional dewatering using screen centrifuges necessary
- Particles may be smaller than 1 mm
- No air bubbles or other effects interfere with separation

Economic benefits

- Minimal manpower requirements
- Operating times of more than 8000 hours per year
- Limited consumption of fresh water

Environmentally friendly

- Closed design which reduces odor emissions
- Minimal waste water production

FLOTTWEG – YOUR VERY COMPETENT BUSINESS PARTNER

References

In Germany FLOTTWEG SYSTEMS are in operation

- for recycling films and DSD¹⁾ mixed plastics
- for recycling industrial plastics
- for recycling cable insulation

Additional systems have been delivered to the UK and to China. In Japan, many FLOTTWEG SORTICANTERS® for mixed plastic treatment have been in operation for years.

All our systems produce high quality re-granulate!

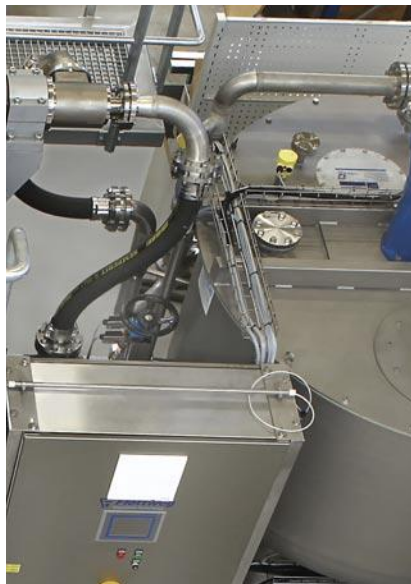
¹⁾ Duales System Deutschland: Organizer of waste separation and recycling in Germany

FLOTTWEG was present from the beginning, when plastic recycling in Germany went mainstream in the 1990s. Since then, we have been delivering complete systems for wet-mechanical sorting and washing of plastic mixtures. You will profit from our experience and knowledge during engineering design, the selection of components, or in the specification of measurement and control systems. FLOTTWEG boasts a well-equipped test facility with an experienced team for system design via small commercial-scale testing in order to provide the best system technology for your application.

Solids discharge heavy phase (on the left), light phase (on the right)



Feed of the suspension and discharge of the liquid separation medium, mixing tank



FLOTTWEG SORTICANTER® system
From the left: SORTICANTER® with solids discharge, heavy phase, light phase, mixing tank and dosage system



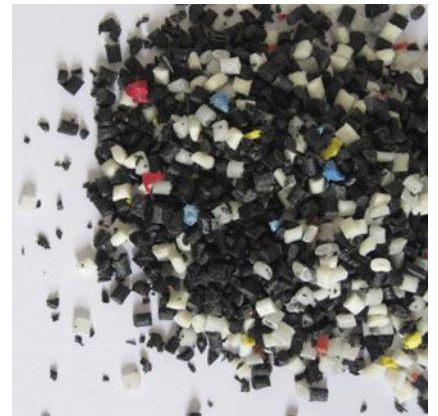
TYPICAL APPLICATIONS



- DSD¹⁾ films
- DSD mixed plastics
- Plastic fibers and films
- Mill material of blown bottles
- Recovery of PET flakes
- Granulate from production waste and returned materials
- Granulate from plastics after medical application
- Cable insulation
- Carpet fibers

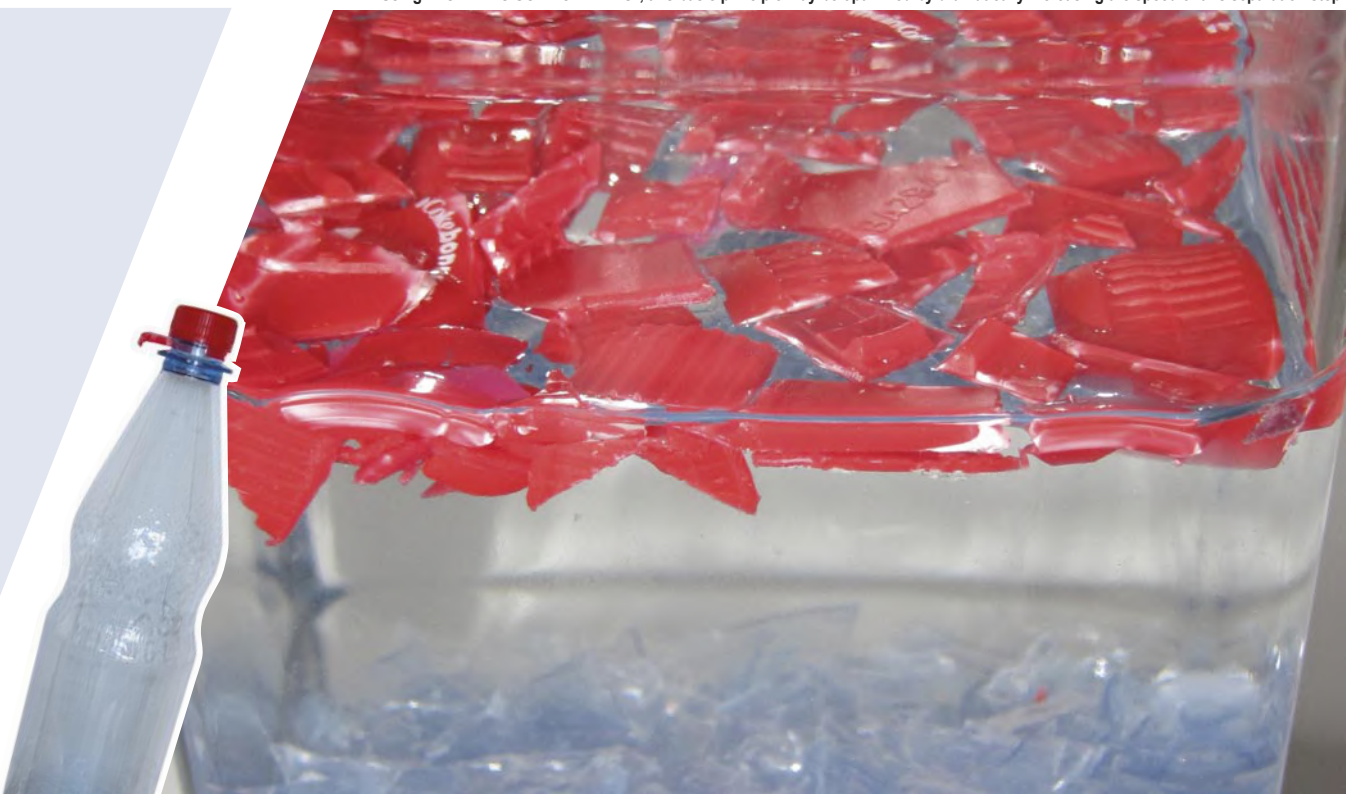


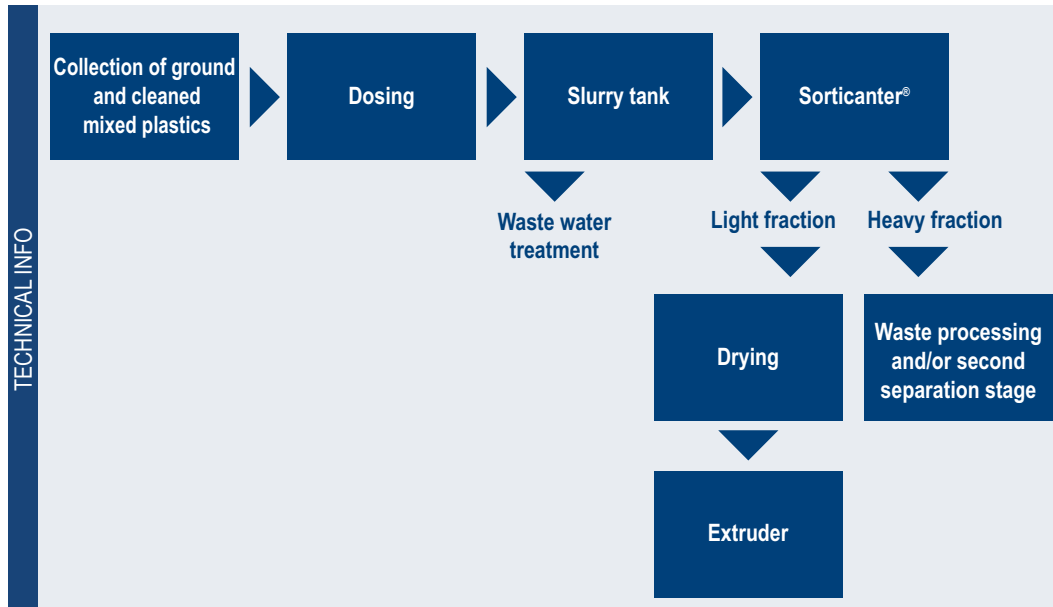
FLOTTWEG SORTICANTER® system for the recovery of polyolefins from mixed plastics at a German company



Granulate of different plastics before separation

Plastics with different densities (cap/bottle) of shredded PET bottles already separate in a swim-sink process. Using FLOTTWEG SORTICANTERS®, this basic principle may be optimized by dramatically increasing the speed of this separation step.





	SORTICANTER® K4D-4/444*	SORTICANTER® K6E-4/444*	Achievable residual moisture
Sorting mixed plastics with a bulk density of the light fraction of 25 g/l	180 kg/h	400 kg/h	< 15 %
Sorting mixed plastics with a bulk density of the light fraction of 35 g/l	280 kg/h	600 kg/h	< 15 %
Sorting granulates with a bulk density of more than 300 g/l	800 kg/h	1600 kg/h	ca. 2–3 %
Sorting DSD films with a bulk density of the light fraction of 25 g/l	200 kg/h	440 kg/h	< 15 %
Sorting cable insulation with a bulk density of the light fraction of 450 g/l	800 kg/h	2000 kg/h	ca. 4 %
Sorting PE/PP blown bottles with a bulk density of the light fraction of 320 g/l	1000 kg/h	2000 kg/h	ca. 2–3 %
Sorting PET blown bottles	800 kg/h	2000 kg/h	ca. 2–3 %

* The listed figures are guidelines to be used for information only. Actual capacity depends on the characteristics of the feed.





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