

Bollegraaf Recycling Solutions is the trading name of Bollegraaf Recycling Machinery bv and Lubo Systems bv.

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### **Bollegraaf Recycling Solutions**

Tweede Industrieweg 1  
9902 AM Appingedam  
Nederland  
Tel: +31 (0)596 65 43 33  
Fax: +31 (0)596 62 53 90  
info@bollegraaf.com  
www.bollegraaf.com

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Sorting your business



**Bollegraaf**  
RECYCLING SOLUTIONS





**Bollegraaf  
Solutions for  
Plastics  
Recycling**

Sorting your business



**Bollegraaf**  
RECYCLING SOLUTIONS



## Bollegraaf Sorting your business

**At Bollegraaf, we appreciate the fact that, like any other profit driven operation, the recycling industry is subject to economic changes. We help you sort your business and make it as profitable as possible.**

Although domestic recycling initiatives continue to gain momentum and consumer demand for recycled goods is increasing, commodity prices for recycled materials tend to fluctuate. In this respect, you are always looking for the best possible return on your investment. Sorting waste is our specialty. Keeping your operation profitable is our ultimate goal. We believe that the key



to a profitable recycling installation is creating the highest possible value for your recyclables. In order to do this, your aim should be to maximize separation quality while keeping your operational costs to a minimum. With a track record of 50+ years in the industry, we can help you achieve just that.

Bollegraaf's extensive experience in the recycling industry makes us the ideal partner for finding the best solution for your business model. Your business inspires our engineers and technicians to build machines, systems, and installations tailored to your needs. It is the very reason we keep innovating and improving our machines.

Our technological advancement offers you maximum flexibility, efficiency, and the highest throughput. Choose Bollegraaf and make the most out of waste.

We invite you to see it with your own eyes. Join us for a visit to one of our reference projects or take a tour around our production facility in the Netherlands. I hope to see you there.

Sincerely,  
Heiman Bollegraaf, CEO

A handwritten signature in blue ink that reads "H.S. Bollegraaf". The signature is stylized and fluid, with a long horizontal line extending from the end of the name.



## Create value out of Plastics

**Optimizing output in terms of economic value against the lowest possible costs per tonne. This is the short-term goal for every installation that Bollegraaf provides. The long-term goal is to ensure permanently low operating costs and achieve an optimal return on investment.**

The worldwide demand for recycling of used plastics is growing rapidly as more and more applications are being introduced for the increasing demands and encouragements to use recycled plastics. Recycling companies who are contemplating in investing in plastics sorting equipment will expect to find their return in investments to be of a profitable venture. Bollegraaf's effective and innovative solutions in design engineering, have mastered the manufacture and supply of equipment to effectively remove the plastics from waste; preventing it to become landfill. Our equipment is currently introduced into existing combined waste streams and complete dedicated (plastic)sorting installations.

### **Advantages of working with Bollegraaf**

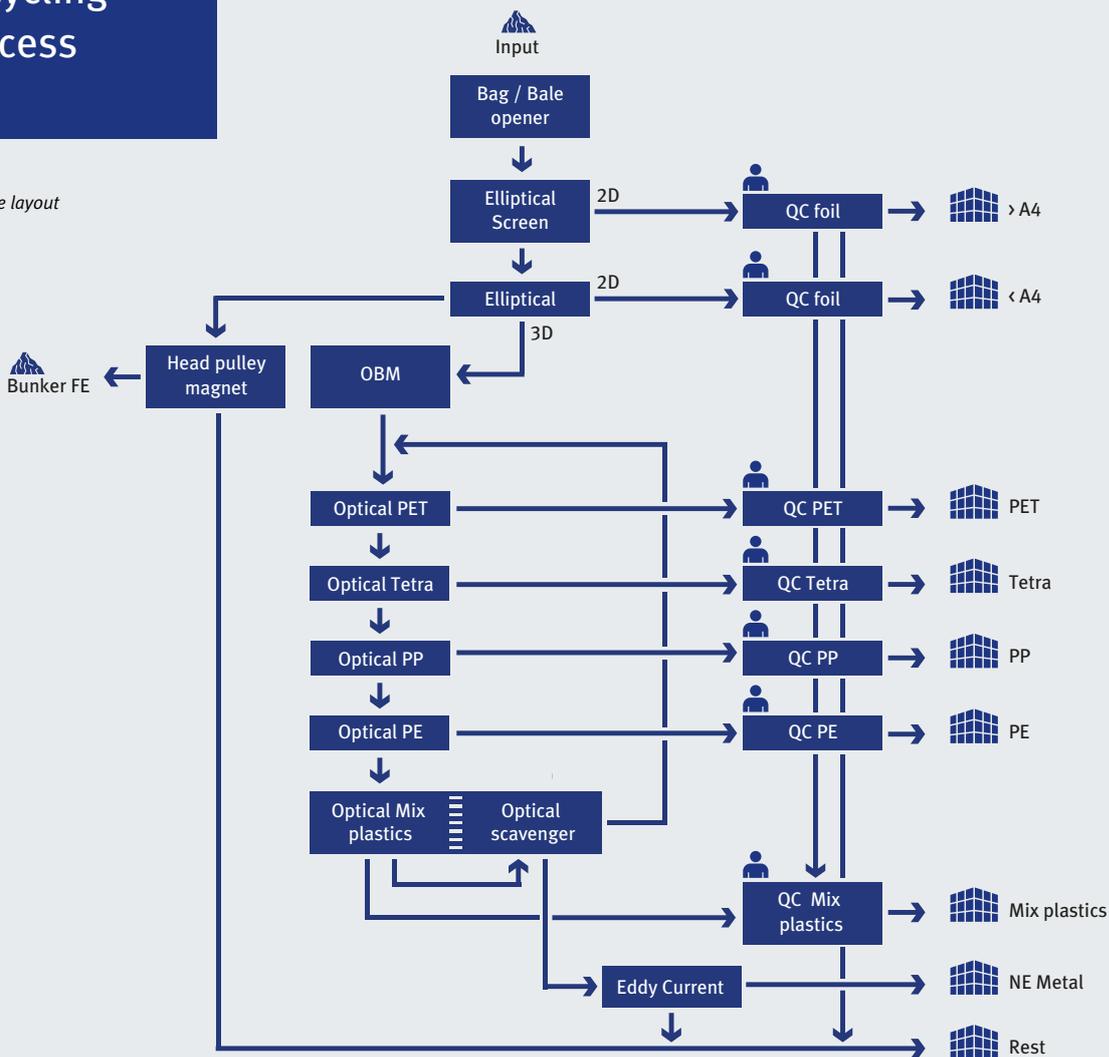
**With more than 50 years of experience worldwide, Bollegraaf is one of the most knowledgeable suppliers in the industry for recycling machinery. We are aware there is no single specification for the composition of waste; it can vary per country, per region, or per city. The requirements for the output of the separation system will also vary; depending on the available markets for recycled products, is why we believe that versatility is essential. It inspires us to engineer, build and deliver bespoke solutions that are easy to use, to have a low cost of ownership and above all, to perform to your specifications whilst offering an excellent return on the investment.**

- **Versatility:** our installations are easily adjusted to fluctuations in input streams and/or output requirements. Even daily variations in waste streams can be handled by the adjustability and fine-tuning possibilities featured in most of our machines. This ensures that a Bollegraaf installation will last for many years and remain up-to-date, even when markets change, our installations have the ability to change with it.
- **Quality:** we believe quality is indispensable. That's why we only use name brand components from qualified suppliers. This ensures all our installations will provide the durability you require in getting efficient performance every day with as little downtime as possible. Your installation will be trouble-free for many years to come.
- **Customization:** by always put our customers first. Our worldwide delivery program consists of complete sorting systems for the waste paper industry and plastics recycling, collectors of industrial waste and household waste, municipalities, and companies that produce voluminous waste. We also feature R&D backup for bespoke products hence enabling us to offer our customers their challenging requirements; whatever they may be.
- **Eco-friendly:** we are not only active in an industry that's rapidly going green. At Bollegraaf we are very aware of our own corporate responsibilities towards the environment. From our preferences in using water-based paints, investments into the latest advances towards reducing energy and oil consumption; to the use of recycled materials for all our communication and promotional activities, we are making a conscious effort to help protect our planet.
- **Experience:** with over 50 years of worldwide experience in all areas of recycling. We know the local market characteristics and requirements as well as local laws and regulations, and we anticipate market changes in collaboration with our clients. We know recycling!



# Bollegraaf Plastics Recycling Process

Example layout



## Example layout of a plastics sorting installation

The purpose of this installation is to separate, sort and process valuable packaging materials, such as PET, PE, PP, and Tetrapak, ferrous and non-ferrous metals, which are then baled and shipped for reuse.

**1** Packaging materials are fed into the plastics recovery facility via a bag opener. This material basically consists of plastics such as foil, PE, PP and PET bottles, Tetra Pak and various metals.

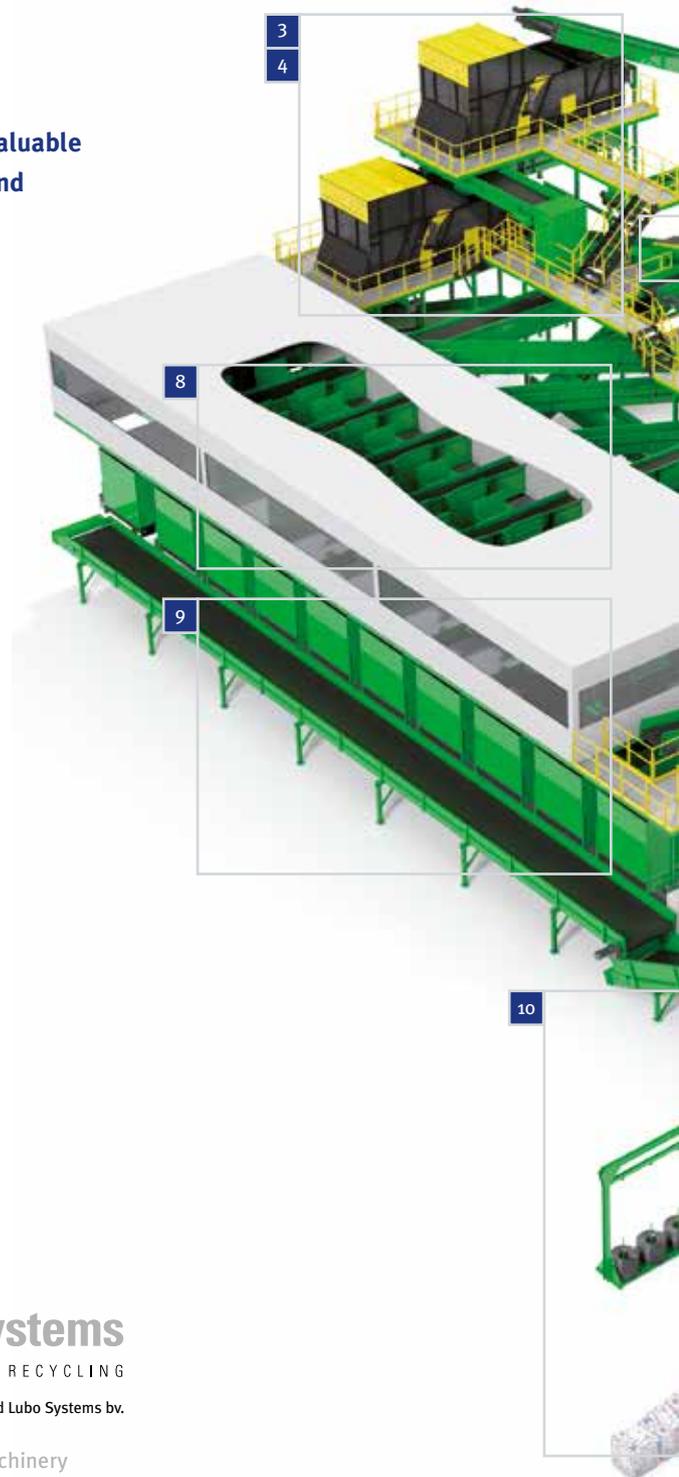
**2** Bollegraaf trough and slider belt conveyors belts ensure efficient transportation of the materials through the entire sorting system.

**3** The materials are fed into a Lubo Ballistic/Elliptical screen which segregates foil over A4 size from the materials stream.

**4** The remaining 2D and 3D materials are then passed to a second, finer Lubo Ballistic/Elliptical screen which then separates smaller foils from 3D materials.

**5** The 2D materials stream runs over a head pulley magnet and the 3D materials stream is led via an over band magnet, in order to collect the ferrous metals. These metals are collected in a Bollegraaf slider belt bunker.

**6** High speed optical sorters are then used to separate PET, PE, PP and Tetra Pak from the main materials stream. An optical scavenger is installed after these sorters to bring the remaining valuables back into the sorting line.



Dedicated technology for strong solutions



**Bollegraaf**  
RECYCLING MACHINERY



**Lubo Systems**  
SCREENING & RECYCLING

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See also [www.bollegraaf.com/used](http://www.bollegraaf.com/used) for our daily updates on in-stock used machinery

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### Bollegraaf conveyor belts

Bollegraaf conveyor belts are renowned for their extremely solid construction and guaranteed long operational lives. The complete series comprises of chain belt conveyors, troughed belt conveyors, gravity/sliding belt conveyors, and steel belt conveyors.

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### Lubo Elliptical

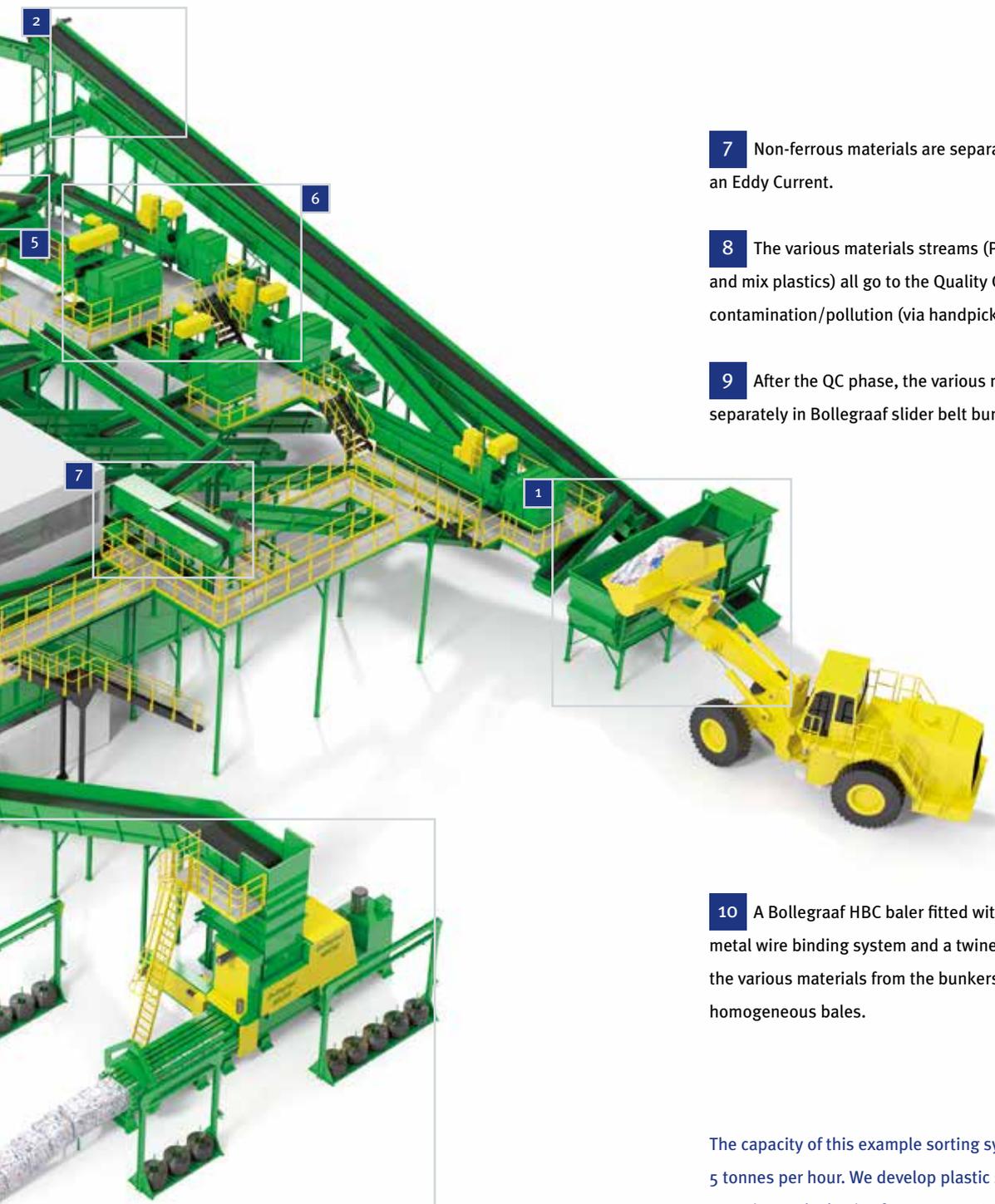
The Lubo Elliptical is used to separate 2D materials from 3D. The grids on the paddles can be easily adjusted for variable screening by size. The Lubo Elliptical offers various advantages over traditional ballistic screens.

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### High speed optical sorting units

High speed optical sorters (such as Titech) use infrared technology to scan and sort large quantities of materials such as mixed plastics, mixed paper and MSW materials. Expected recovery and purity rates are in the 90%–99% range.



7 Non-ferrous materials are separated from the stream with an Eddy Current.

8 The various materials streams (PET, PE, PP, foils, Tetra Pak and mix plastics) all go to the Quality Control centre to further reduce contamination/pollution (via handpicking or robotic (Bollegraaf RoBB)).

9 After the QC phase, the various materials are collected separately in Bollegraaf slider belt bunkers.

10 A Bollegraaf HBC baler fitted with a bottle perforator, a metal wire binding system and a twine tying system processes the various materials from the bunkers into compact, heavy and homogeneous bales.

The capacity of this example sorting system is approximately 5 tonnes per hour. We develop plastic sorting systems with any capacity on the basis of your request.

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**Bollegraaf RoBB QC Sorting Robot**

RoBB can drastically reduce your operational costs in the quality control phase of your sorting line. RoBB delivers optimum purity and separation quality on various materials (various types of plastics, paper and other materials) resulting in a significantly higher value for your output.

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**HBC Baler**

The world-renowned Bollegraaf fully automated HBC balers turn large quantities of various types of waste into homogenous bales. The capacity and pressure force of the HBC balers ranges from 25 to 180 tonnes. Besides the HBC range, Bollegraaf also offers a full range of sheer balers (HBK series) and small, semi-automatic balers (SA series).



**Bollegraaf BIOS Operating System**

Bollegraaf's own operating and control system, BIOS (Bollegraaf Information and Operating System), controls the performance of everything from single machines up to complete sorting installations.