



Circular Economy

Maximum Efficiency with Minimal Resource Use – A Milestone for the Plastics Recycling Industry

METZEN has developed a groundbreaking solution that enables sustainable plastics recycling with maximum efficiency and minimal operating costs – a milestone for the entire industry. Our client benefits from a future-ready system that reduces costs, exceeds environmental standards, and provides flexibility for upcoming challenges.

In a demanding project to realise one of Germany's most advanced recycling plants, METZEN developed a customised solution for a washing and separation line, including a drying system, for the processing of PP films.

Challenge

Highest Efficiency – Minimal Water Use

The plastics recycling industry faces the challenge of developing efficient and sustainable solutions – also to meet increasing demands for resource conservation and cost-effectiveness. Achieving top-level results often requires bespoke solutions. METZEN proved to be the right partner with a plant solution for a waste management company. A standard solution was not feasible for several reasons:

- **Severely restricted space:** The spatial conditions were so complex that a custom design was necessary.
- **No direct connection to a wastewater treatment plant:** Water consumption during production had to be minimised.
- **Maximum operating cost reduction:** The plant needed to operate as energy- and resource-efficiently as possible to minimise running costs.
- **Highest quality requirements:** The new plant had to process 100% film content at a throughput of over 1,500 kg/h with optimal recyclate quality. By comparison, a 4th-generation plant typically achieves only 1,000–1,200 kg/h.

Solution

Technology Meets Innovation

To meet these demanding requirements, METZEN developed a tailored solution that addressed all challenges.

- **Patented dry-mechanical cleaning:** Through the innovative use of a dry-mechanical cleaner, exceptional material purity was achieved with minimal residual moisture – entirely without water use. This technological advancement marks a decisive milestone, significantly reducing the energy demand of the downstream extruder.
- **Optimised process control:** After cleaning, the recyclate can be fed directly through the dryer without an additional suction fan. This ensures smooth material flow and enables the desired throughput.
- **Elimination of process steps:** The plant is designed so that the usual size-reduction step after the shredder is completely eliminated. Streamlining the process significantly increases speed and overall efficiency.

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Result Sustainable, Cost-Saving, and Future-Proof

METZEN has demonstrated that sustainable, customised solutions are possible even for energy-intensive companies. We develop intelligent, modular systems that perform today while already meeting tomorrow's requirements.

With the implementation of the new plant, we exceeded all client expectations. It is one of the most energy-efficient and resource-conserving plants in Germany in this market segment.

- **High Throughput:** The plant processes 1,500 kilograms of plastic per hour with ease.
- **Energy Efficiency:** Water-free operation and reduced process steps significantly lower energy consumption.
- **Resource Conservation:** The plant contributes significantly to the conservation of valuable resources such as water and energy.
- **Cost Savings:** Considerably lower operating costs and rapid return on investment.
- **Highest Product Quality:** 100% film content is ensured with optimal recyclate quality.
- **Future-Readiness:** An investment in a sustainable future.

METZEN stands for highly efficient solutions in industrial plant and machinery engineering.

Our senior engineers are happy to advise on your individual project. We deliver results – from analysis to implementation. Precise, fast, and decisive.

Highlights

- **Maximum Performance:** Processing 100% film content at a throughput of 1,500 kg/h – significantly above the industry average.
- **Resource Savings:** The plant operates without a connection to a wastewater treatment plant and uses water sparingly.
- **Operating Cost Reduction:** Savings of €2,250,000 over a 15-year lifespan.

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