BT systems

Technologies for a brand new world

REDWAVE CX / XRF

GLASS SORTING

Plant Solutions &
Sensor-Based Sorting Systems

RECYCLING

Maximum End-Product Purity

HIGH-EFFICIENCY CULLET PROCESSING
at the highest Level

Requirements in glass recycling continue to rise: higher purity levels, maximum material recovery, and consistently stable processes. Modern plant solutions therefore rely on intelligent, sensor-based sorting technologies that enable both economically and environmentally sustainable glass processing.

REDWAVE develops comprehensive solutions for the glass recycling industry – from material analysis through to turnkey plants. The objective: a consistent material flow with minimal glass loss and maximum product quality.

Typical Applications

Colour Sorting
» Clear, amber, and green glass
» Dark glass and mixed colours

Contaminant Removal
» Ceramics, stones, and porcelain (CSP)
» Metals (ferrous and non-ferrous)
» Plastics and composite materials
» Glass ceramics and lead glass

Quality Control
» Incoming material inspection
» Monitoring of final product quality

MATERIAL DETECTION CAPABILITIES


Clear glass


Green glass


Amber glass


Dark glass


Mixed colours

Colour sorting – detection based on chemical composition of clear glass

With the REDWAVE CX sorting system, different grades of clear glass can be recovered based on their chemical composition.

High sensitivity


Pass / Eject

Medium sensitivity


Pass / Eject

Low sensitivity


Pass / Eject

CONTAMINANT REMOVAL


CSP *


Metals


Plastics


Glass ceramics


Lead glass

Recovery of Dark Glass from CSP


Dark Glass

Historically, dark and thick glass could not be reliably distinguished from opaque contaminants such as ceramics due to low transmission values. As a result, valuable material was often lost to reject streams. The ability to accurately sort dark glass significantly reduces material loss and increases overall plant productivity.

* CSP = Ceramics, Stones, Porcelain

Your added value

» Highest purity of end products
» Maximum glass recovery
» Reduced disposal and operating costs
» Scalable solutions for any plant size

AI-POWERED SORTING TECHNOLOGY

A technological breakthrough in sorting is revolutionising recycling

TANGIBLE CUSTOMER BENEFITS

Optional Extension

Higher purity. Lower losses. Improved profitability.

AI-supported sorting logic delivers measurable improvements across the entire process chain. It enhances separation accuracy, stabilises operations, and increases plant efficiency – even under demanding operating conditions:

- Increased glass recovery through more precise material detection and classification
- Maximum product purity for consistent quality in demanding markets
- Stable sorting processes despite fluctuating input quality
- Higher throughput combined with improved sorting performance

Sensor based sorting for maximum precision

REDWAVE sorting systems combine state-of-the-art sensor technology with intelligent software. Depending on the application, different technologies are deployed – precisely tailored to the material stream and the desired end product.

AI as an integral part of REDWAVE sorting technology

It is an integral part of the REDWAVE system architecture; it is scalable, future-proof and flexible enough to accommodate new areas of application.

REDWAVE CX

The **REDWAVE CX** is a high-performance, camera-based sorting system designed for glass recycling applications.

Function

» Camera and lighting systems detect colour and material
» Sensor fusion enables additional detection (metals, plastics)
» High-precision air nozzles separate materials in real time

Technology Highlights

» Unique 3-way sorting system for maximum efficiency
» Modular design for various particle sizes and applications
» Consistent sorting performance across both eject streams
» High detection rates through optimised sensor technology
» Separation of lead glass and glass ceramics in a single process step
» Maximum sorting accuracy without misclassification
» Suitable for both fine and coarse material fractions

Typical Applications

» Colour sorting
» CSP removal
» Removal of metals and plastics

Other sorting technologies

» **NIR (near-infrared):** plastic detection
» **All-metal sensors:** metal separation
» **Analysis systems:** Qquality monitoring
» **Flap:** Separation of difficult-to-extract objects

REDWAVE XRF

The **REDWAVE XRF** uses X-ray fluorescence to identify the chemical composition of materials.

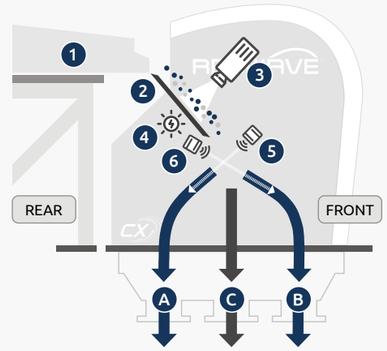
Function

» X-ray sensors analyse elemental composition
» Precise detection regardless of colour, contamination, or moisture
» Ejection via valve system

Technology Highlights

» Separation of lead glass and glass ceramics in a single process step
» Maximum sorting accuracy without misclassification
» Suitable for fine and coarse material fractions
» Colour sorting
» CSP removal
» Removal of metals and plastics

3-Way Functional Principle



1 Vibratory feeder
2 Material chute
3 Camera unit
4 Illumination unit
5 Valves and nozzles (front)
6 Valves and nozzles (rear)
A Front-to-rear eject chute
B Rear-to-front eject chute
C Pass

Your Benefits

» Maximum sorting accuracy
» Flexible adaptation to material streams
» Reduced number of sorting stages and overall plant complexity
» Future-proof technology platform

Tailor-Made Solutions

PLANT SOLUTIONS
Integrated Glass Processing Systems

As a general contractor, BT-Systems delivers complete plant solutions – from initial planning through to commissioning.

Scope of Services

» Process design and material flow analysis
» Mass balance calculations
» Plant design and engineering
» Supply of all components
» Control systems and software integration
» Installation and commissioning
» Service and operational support

REDWAVE brings decades of experience in the glass recycling industry.

OPTIMISED PROCESS CHAINS

Efficient glass processing is built on perfectly coordinated process steps:

1. Pre-treatment and material feeding
2. Homogenisation of the material stream
3. Sensor-based sorting
4. Quality control and final cleaning

CUSTOMISED PLANT CONCEPTS

Each plant is precisely tailored to customer requirements:

» New builds or modernisation of existing plants
» Integration into existing processes
» Scalable for future requirements

The goal: a stable process with maximum material recovery and minimal losses.

INPUT MATERIAL	WASTE GLASS FROM COLLECTION SYSTEM / MRF GLASS			SEPARATION OF
PRE-TREATMENT	Crushing, drying, screening, optional manual sorting, metal & organic removal			Metals, organics, oversize contaminants, moisture, fine material
SORTING STAGE 1	Separation of CSP, lead glass or plastics, glass-ceramics and metals			CSP, lead glass or plastics, glass-ceramics, metals
SORTING STAGE 2	Separation of lead glass or plastics and color sorting			Ceramics, porcelain, stones, plastics or lead glass
SORTING STAGE 3 (optional)	Color refining (flint / green / amber glass)			Off colours, contaminants
SORTING STAGE 4 (recommended)	Glass recovery from CSP waste			Recovered glass
QUALITY CONTROL	Flint glass	Green glass	Amber glass	
FINAL PRODUCT	Flint glass	Green glass	Amber glass	

YOUR PARTNER FOR SUSTAINABLE SUCCESS

With decades of experience in glass recycling, BT-Systems stands for:

» Technological innovation
» Process reliability
» Lifecycle profitability

The result: ultra-pure glass products, stable processes, and maximum value creation.

BT systems

Technologies for a brand new world

BT-Systems is an international mechanical engineering and automation company and offers system integrations for innovative, cost-efficient industrial solutions. From planning and commissioning through to service, we operate worldwide in the following areas:

AUTOMATION

CONVEYOR

INTRALOGISTICS

QUALITY

RECYCLING

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