# WASTE RECOVERY

## Glass, tiles, sanitary ware, fiberglass and much more

# Glass waste recovery

Minerali Industriali recycled glass treatment combines traditional ore dressing processes with the most recent sorting technologies. In this way, Minerali Industriali ensure the total recovery of the glass waste: an eco-friendly solution with an high quality cullet production.

## TREATMENT STAGES

The aim of the glass waste treatment is to remove external materials, first of all ceramic (because of the stones problems in the glass factories), metals, plastic and organic residual (with their high carbon rate).
Glass waste treatment is composed by three subsequent stages:

**1** Preparation stage: remove metals and the material part under 10 mm. This fraction's ceramic content is in fact hard to remove by the sorting machines

**2** Optical sorting stage: remove ceramic by optical recognizing. The outcome of this selection is already an high quality cullet. It's also possible to reduce the Pb rate with UV sorting machines

**3** Washing and milling stage: so far rejected material represents the 25% of the income waste, with 70% glass content, 30% of ceramic and an high carbon rate. Minerali Industriali is able to successfully recover this part by washing treatment (reduction of carbon rate) and a fine milling (<1 mm), allowing the ceramic melting in the glass factories without stones problems (Glassy Sand)

# WASTE PREPARATION

This is the preliminary treatment of the glass waste recovery.

**1** GLASS FROM
WASTE COLLECTION

▼

DEDUSTING, PAPER AND
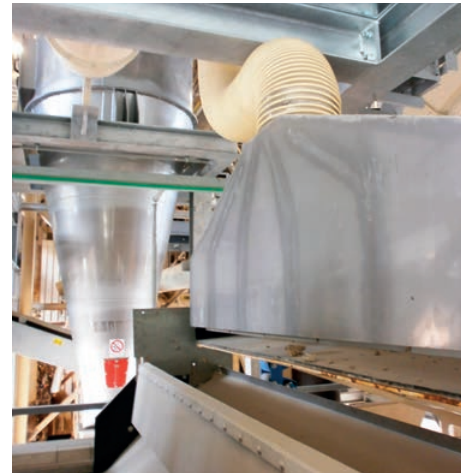PLASTIC BAG ASPIRATION

▼

DEIRONING

▼

CRUSHING (<40 mm)

▼

SCREENING @ 10 mm

**3** FINE FRACTION
to the washing stage

**2** COARSE FRACTION
to the optical sorting stage

# CULLET PRODUCTION BY OPTICAL SORTING

After the preparation treatment, the glass is introduced in the optical sorting stage, to remove the ceramic grains.

**2**

**COARSE FRACTION**
from preparation stage (100%)

**DRYING**
(optional, for Pb reduction)

**3**

I STAGE **OPTICAL SORTING**

**OPTICAL REJECT (20%)**
Composed by 70% of glass
and 30% of ceramic,
plastic, etc...

II STAGE **OPTICAL SORTING**

III STAGE **OPTICAL SORTING**

**to the washing
and milling plant**

**HIGH Pb GLASS GRAINS UV
SORTING** (optional)

**HIGH Pb GLASS (5%)**
(ready to be sold for
non glass application)

**CULLET (75%)**
(ready to be sold to glass factories)

# GLASSY SAND PRODUCTION

Previous stages rejected fraction has a consistent percentage of high melting material (ceramic) and an high carbon rate (typically 2% in weight) due to the presence of plastic and residual liquids on the bottles: this material can't be used directly in glass melting. Thanks to its ore dressing experience, Minerali Industriali apply a washing treatment to reduce the carbon rate and a fine milling process to allow the remaining ceramic part to be melted without stones problem in glass factories. The result is Glassy Sand. In addition, Minerali Industriali has developed an high dense media treatment and an high efficiency laser sorting to reduce the Pb level in the glass.
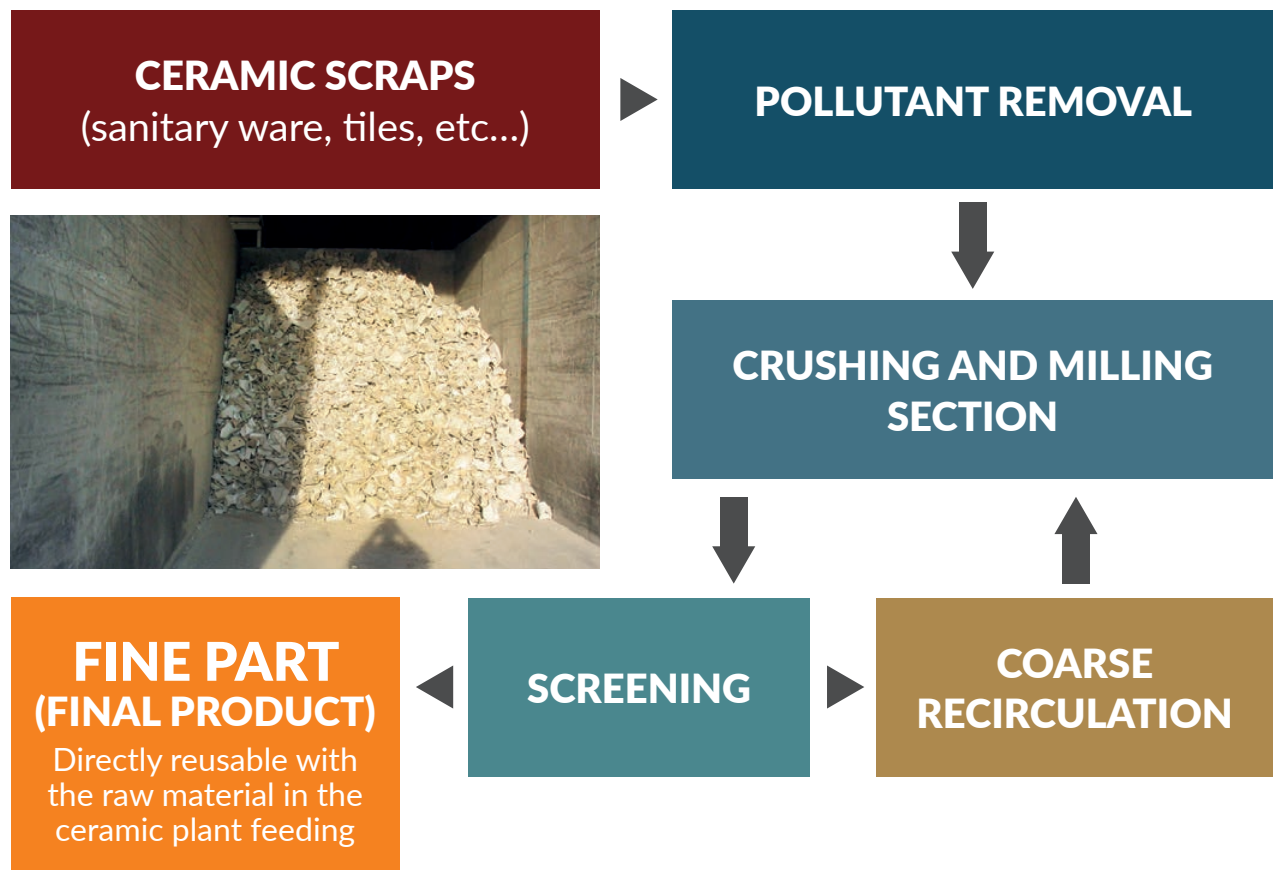


**3**

**WASHING PLANT**
(CARBON RATE REDUCTION)

**WATER CLARIFICATION CIRCUIT**
(PHYSICAL/CHEMICAL ORGANIC REDUCTION)

**SCREENING @ 5 mm**

**HIGH Pb GLASS**
(ready to be sold for non glass application)

**<5 mm:**
Pb rate reduction with **DENSE MEDIA SEPARATION (TRI-FLO)**

**>5 mm:**
Pb rate reduction by ceramic removing **HIGH EFFICIENCY LASER SORTING**

**LOW Pb GLASS**
(<200 ppm Pb)

**CERAMIC**
(milled and sold to ceramic factories)

**GLASSY SAND**
(ready to be sold to glass factories)

**DRYNG AND FINE MILLING WITH RHP ROLL MILLS**

**LOW Pb GLASS**
(<200 ppm Pb)

**WHITE CULLET**
(ready to be sold to glass factories)

# SANITARY WARE AND TILES

Sanitary ware and tiles manufacturing processes always produce a small quantity of scraps, but its accumulation may become a problem. Recover this fraction means to reduce the scraps stock and to produce a pre-fired raw material, with the same quality of the final product and with saving firing energy properties.



Minerali Industriali ceramic waste treatment plants are a real solution, successfully installed in many ceramic ware factories.

**CERAMIC SCRAPS**
(sanitary ware, tiles, etc...)

▶ **POLLUTANT REMOVAL**



**CRUSHING AND MILLING SECTION**

**FINE PART (FINAL PRODUCT)**
Directly reusable with the raw material in the ceramic plant feeding

◀ **SCREENING** ▶ **COARSE RECIRCULATION**

# FIBERGLASS RECOVERY

Fiberglass waste and scrap are usually disposed in landfill: currently fiberglass waste can't be reintroduced in the melting process. Minerali Industriali patented an innovative technology to recover this precious material. The result? A regenerated raw material ready to be used in the normal fiberglass production.



**FIBERGLASS WASTE AND SCRAP**

**DISRUPTION**

**PATENTED TREATMENT**

**FINE MILLING** ▶ **FIBERGLASS POWDER**
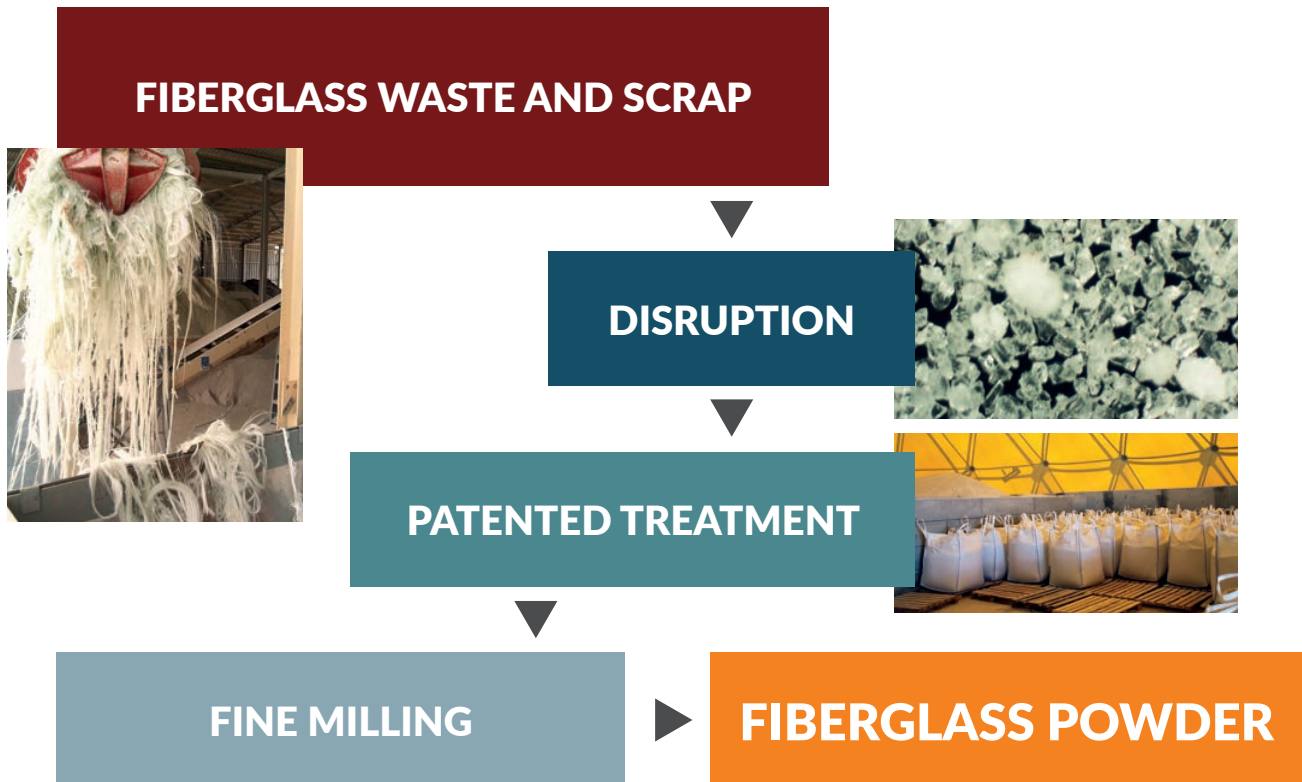
## And much more...

Minerali Industriali successfully treats and recovers artistic glass, lamp glass and CRT monitor front glass. Minerali Industriali is also available to study, propose and realize tailored made solutions to recover a large variety of waste or scrap (ashes neutralization, sludge treatment, foundry rejects, etc...).
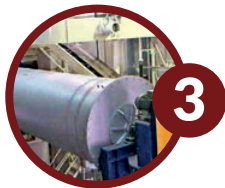
# SOLUTION 360°
## FROM MINE TO PRODUCTS

**1** GEOLOGICAL SURVEY

**2** LABORATORY TEST

**3** INDUSTRIAL TEST

**4** LAYOUT DEFINITION & ENGINEERING

**5** DEDICATED TURN-KEY SOLUTIONS

**6** CUSTOMER CARE

SOLUTION 360°
FROM MINE TO PRODUCTS