



**TB** **Tecno-Beton**  
RCS RECYCLING CONCRETE SYSTEM

# RCS: RECYCLING CONCRETE SYSTEM

## OUR OBJECTIVES

### RESPECTING THE ENVIRONMENT

The application on site of the system makes a significant contribution to the respect of norms regarding the environment, and permits:

- management of water resources;
- management of waste;
- protection of the soil;
- improvement of the workplace environment.

### ECONOMIC SAVINGS

The complete system process allows the site to reduce process costs through the reduction of the following:

- maintenance and cleaning of the tank area;
- maintenance, transport and management of waste water;
- reduction/removal of waste disposal costs;
- lower water and fine aggregate requirements.



# QUALITY AND INNOVATION IN EVERY PHASE OF PRODUCTION

During production large quantities of concrete residue and washing water come from the mixing plant and concrete mixer trucks. The disposal of these materials is a significant problem for the environment.

Tecno-Benton has developed systems for the separation of concrete residue coming from left-over material and from the washing of mixer trucks using the RCS system together with the SCS system.

For both systems, the residue water collected in the tanks can be re-used for the preparation of concrete, in accordance with the applicable norms.



TECNO-BETON'S PATENTED SYSTEM FOR  
THE TOTAL TREATMENT OF SURPLUS CONCRETE

# THE SOLUTION TO UPGRADE YOUR PLANT



# ADVANTAGES IN TERMS OF SAVINGS AND ENVIRONMENTAL PROTECTION

Every industrial activity must comply with norms which have changed the way of working compared with the past. The norms in force which govern the certification of the production process include UNI1008 and Italian Law (DLgs) 152/06.

Norm UNI 1008 establishes the rules for the use of water in the process, stating that **“the maximum quantity of solids added through waste water must be less than 1% of the total weight of the aggregates”**: the limit set by

**the law is fully respected when using the RCS system.**

Italian law 152/06 sets out the rules for the protection of the earth and protection of water from pollution and management of water resources.

Tecno-Beton has always undertaken research and development to find technical solutions which are able to efficiently separate water from cement products.

**The RCS system can be applied to any existing plant for the separation of residues.**

## CURRENT USE OF CLASSIC PLANTS

Currently on sites an initial separation is carried out of heavy particles and water with a high content of fine and very fine particles. Despite the fact that this water is kept moving by electric agitators in the collection tanks, a sediment forms which is made up of very fine particles, which produces solid waste.

Aggregates with particle size greater than 5 mm are subdivided using the present separation system. Recycled water is re-used in the production cycle and at the moment no check of the percentage of solids is included.

Current systems are equipped with litre counters for the dosage of water, which give a very relative degree of precision as they do not consider the percentage of solids present in the water. These solids vary throughout the working day and therefore the percentages of water/filler are different during each phase of unloading and loading of the mixer truck.

TODAY THE QUANTITY OF SOLIDS PRESENT IN THE RE-USED WATER IS HIGH AND CANNOT BE MEASURED.

THE SEPARATOR MACHINES CURRENTLY AVAILABLE ON THE MARKET USE DIFFERENT SYSTEMS FOR SEPARATION: WORM SCREWS, SHOCK, AND VIBRATION.

# THE RCS SYSTEM



## LABORATORY TESTS

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Experiments carried out at Bergamo University have highlighted the effect of the use of recycled water taken from the innovative RCS system on the rheological and mechanical properties of concrete.

This system allows the complete recovery of fine aggregates (filler, cement, added minerals, etc.) which come from the washing of mixer trucks by settling and separation.

Research has confirmed that it is possible to use

recycled water from the washing of mixer trucks for the preparation of new concrete.

By correctly evaluating the level of solids contained in the water and carrying out suitable corrections to the composition of the concrete to take into account the quantity of fine particles introduced with the recycled water, it is possible to produce concrete with rheological and mechanical performance which is the same as concrete produced using mains water.

## RCS SYSTEM CHARACTERISTICS

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- Recovery of cleaned water to be re-used in the production process.
- Real-time measurement of percentage of suspended solids.
- High precision dosage of materials (water and fine particles) with a margin of error of less than 1%.
- Automatic re-use of very fine particles in the production cycle.
- No need for the use of chemical products for pressing or drying.
- No need for authorisation for installation. Can be used with any mixer truck washing system.

## ADVANTAGES OF THE RCS SYSTEM

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- Simple and automatic cycle management.
- Reduction and reduction of plant management costs.
- Optimisation of sludge and waste water movement.
- Reduced water supply.
- Product quality control.
- Quantification of components re-used in the production cycle.
- Elimination of disposal of solid waste.

# APPLICATIONS

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After an initial sub-division which takes place in the separator, the water loaded with filler is channelled into the RCS system which, using an ecological, functional, and innovative process, allows controlled re-use, removing any residue.

Separation of products allows them to be re-used.

IN THE FIRST PHASE THE LOADED WATER IS MAINTAINED USING A PLC TO CONTROL THE VALVES AND AGITATORS.

IN THE SECOND PHASE THE CLEANED WATER IS COLLECTED IN THE STORAGE TANK AT THE END OF THE CYCLE.



# PROCESS DIAGRAM



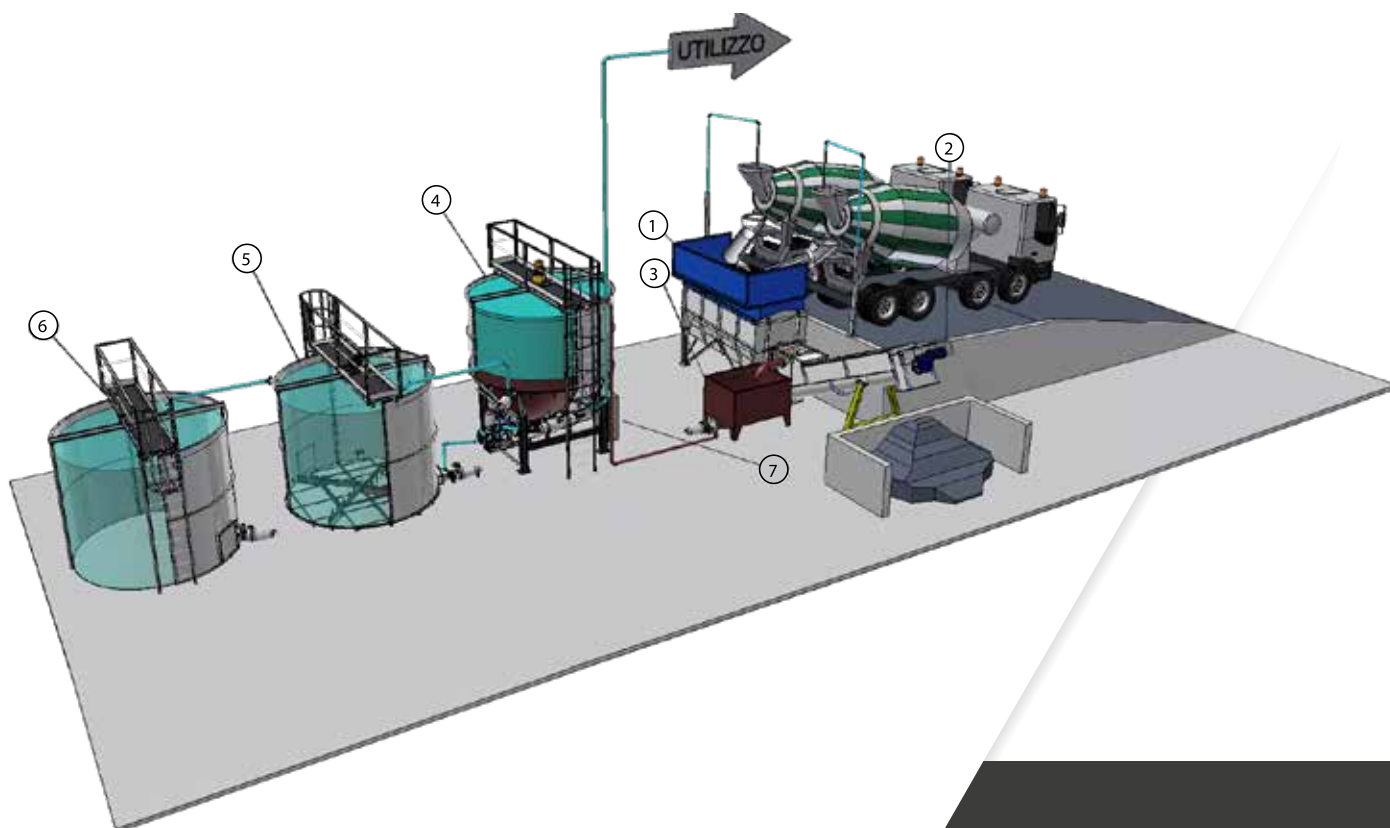


# THE RCS SYSTEM ALLOWS THE COMPLETE RECOVERY OF THE AGGREGATE AND FINE PARTICLES RESULTING FROM THE WASHING OF MIXER TRUCKS.

## COMPONENT PARTS

1. Mixer truck wash water hopper.
2. SCS recovery system made up of loader and separator.
3. Collection tank for process water.
4. RCS containment and storage tank for process water, versions available:
  - Capacity: 11,6 m<sup>3</sup>
  - Dimensions: ø 2000 x 4000 mm;
  - Capacity: 29 m<sup>3</sup>
  - Dimensions: ø 3500 x 4000 mm;
  - Capacity: 40 m<sup>3</sup>
  - Dimensions: ø 3500 x 5000 mm.
5. Storage tank with scraper for fine particles for cleaned water which can be used in the new production process.
6. Containment tank which can be integrated to allow the reduction of pH.
7. PLC management and control interfaced with measurement system and relevant software.

This system allows measurement to be carried out with a high level of precision, the flow, water, and filler data is communicated to the mixing plant thus providing quantitative evidence for the mix design.



# SCS SEPARATING CONCRETE SYSTEM



## SCS COMPONENT PARTS

1. Mixer truck wash water hopper.
2. SCS recovery system made up of loader with 9,2 Kw motor and separator with 5,5 Kw motor.

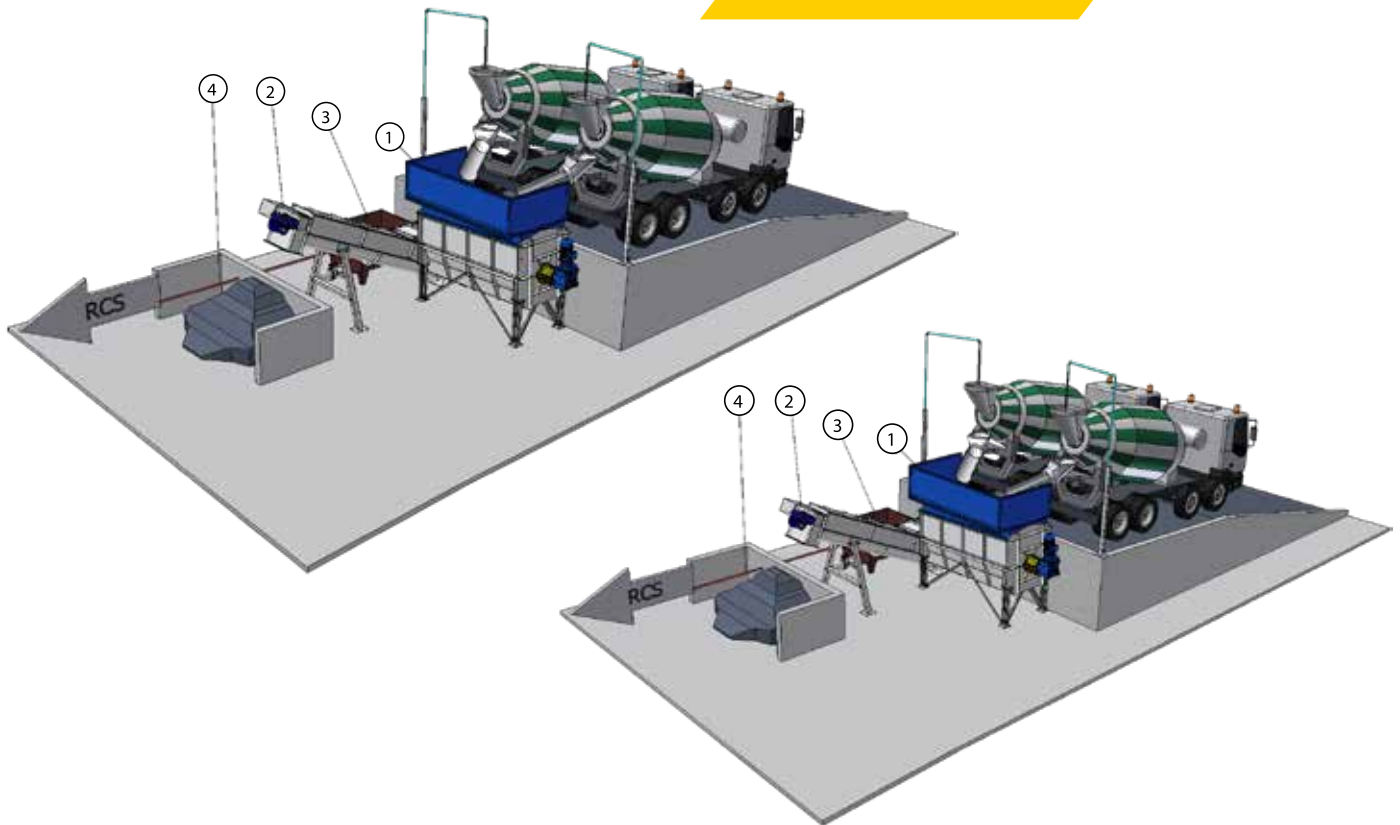
### CARATTERISTICHE:

Maximum production 20 m<sup>3</sup>/h.

Dimensions: 3700x1700x1800 h.

3. Collection tank for process water management.
4. Supply pipework if RCS system is included.

THE SCS SYSTEM MAKES THE RECOVERY OF UP TO 3 M<sup>3</sup> OF SURPLUS CONCRETE POSSIBLE, WITH POTENTIAL DISPOSAL OF EQUAL TO 20 M<sup>3</sup>/H CONCRETE AND FAST RETURN ON INVESTMENT.



#### LOADER CHARACTERISTICS

- Robust construction in galvanized steel.
- Square section shaft with supports for scraper blades.
- Bolted blade support arms.
- Seal unit and Bonfiglioli direct drive gearbox.
- Upper protection grills.
- Safety limit switch with key locking system.
- Rotating head washing unit.

#### SEPARATOR CHARACTERISTICS

- Zinc coated structure.
- Robust coil in highly resistant flat steel.
- Interchangeable internal load support.
- Non-stick polyurethane covering of tank bottom.



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