Returned Concrete with Zero Impact
The global production of concrete amounts to a total of **10 billion m³/year**.

Out of this total, approximately **50 million m³** of concrete is never actually used and is returned to the production plant. Considering just 10% of this total as “critical”, meaning not recyclable while fresh, this translates into **5 million m³** of returned concrete requiring treatment every year.

Returned concrete has a high environmental impact on concrete plants and leads to extra operating costs.

Current systems for treating returned concrete do not offer a sustainable solution in that they:

1. Have a negative impact on the environment
2. Do not make the best use of potentially recyclable material
3. Increase overall operating costs

**RE-CON ZERO** is a solution to these problems, making the most of returned concrete by transforming it into granular material that can be re-used as aggregate in concrete.

- No waste produced
- Added directly into the truck mixer
- No treatment plants required
The pursuit of sustainable development depends on our capacity to guarantee the total interconnection between the economy, society and the environment. These three elements must never be considered as single, independent entities, but rather analysed within a systemic framework as elements which, together, contribute to the achievement of a common goal. This means that every programmed intervention must take all reciprocal inter-relations into consideration. If a programmed intervention focuses on only one or two of these aspects, a condition of sustainability will not be achieved. In view of these considerations, it would be preferable to represent the sustainability of development as three concentric circles, highlighting how the economy exists within a society, and how both exist within the environment. And from this consideration, it is possible to construct a pyramid of sustainability, with the environment forming the base which, through its supply of natural resources, services the ecosystem and wellbeing of society and plays a fundamental support role for the economy and society. And with this in mind, the advantages deriving from the use of RE-CON ZERO may be summarised as follows:

**ENVIRONMENTAL ADVANTAGES:**
- With **RE-CON ZERO**, returned concrete may be completely re-utilised, thus reducing the amount of waste material to be disposed of.
- With **RE-CON ZERO**, the amount of recycled material employed increases, thus reducing the impact caused by the extraction and processing of virgin materials.
- With **RE-CON ZERO**, the amount of materials transported by road decreases, due to the fact that part of the aggregates are produced at concrete plants.

**SOCIAL ADVANTAGES:**
- Its ease of use and absence of hazardous, toxic and carcinogenic substances contained in **RE-CON ZERO** all contribute to improving the health and safety in the work environment.

**ECONOMIC ADVANTAGES:**
- The use of **RE-CON ZERO** transforms one cubic metre of returned concrete into more than two tonnes of quality aggregate.
- The use of **RE-CON ZERO** saves disposal costs for returned concrete and considerably reduces the amount of sludge created during washing cycles.
- The use of **RE-CON ZERO** allows all returned concrete to be recycled without costly investments into machinery or equipment.
SUSTAINABLE RECOVERY OF RETURNED CONCRETE

**STEP 1**
Component A
0.5 kg/m³
Mix for 4 minutes

**STEP 2**
Component B
6 kg/m³
Mix for 3 minutes

**STEP 3**
Discharge

Complete kit to treat 1 cubic metre of returned concrete:

**RE-CON ZERØ Component A:** 1x0.5 kg water-soluble bag

**RE-CON ZERØ Component B:** 6x1 kg water-soluble bags
After mixing for a few minutes with **RE-CON ZERO**, concrete is transformed into granular material which may be discharged on the ground and, once cured, used as aggregate in concrete. **RE-CON ZERO** works with all types of concrete. After discharging the material, the mixing drum is left clean. The **cleaning water** for the mixer drum may be completely **recycled** and used again for mixing.

### CUMULATIVE FREQUENCY OF AGGREGATE DISTRIBUTION

<table>
<thead>
<tr>
<th>SIEVE SIZE (mm)</th>
<th>CUMULATIVE GRADATION (% in weight)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;0.063</td>
<td></td>
</tr>
<tr>
<td>0.063</td>
<td></td>
</tr>
<tr>
<td>0.125</td>
<td></td>
</tr>
<tr>
<td>0.250</td>
<td></td>
</tr>
<tr>
<td>0.500</td>
<td></td>
</tr>
<tr>
<td>1.000</td>
<td></td>
</tr>
<tr>
<td>2.000</td>
<td></td>
</tr>
<tr>
<td>4.000</td>
<td></td>
</tr>
<tr>
<td>6.300</td>
<td></td>
</tr>
<tr>
<td>8.000</td>
<td></td>
</tr>
<tr>
<td>10.000</td>
<td></td>
</tr>
<tr>
<td>12.500</td>
<td></td>
</tr>
<tr>
<td>14.000</td>
<td></td>
</tr>
<tr>
<td>16.000</td>
<td></td>
</tr>
<tr>
<td>20.000</td>
<td></td>
</tr>
<tr>
<td>22.400</td>
<td></td>
</tr>
<tr>
<td>25.000</td>
<td></td>
</tr>
<tr>
<td>31.500</td>
<td></td>
</tr>
</tbody>
</table>

**FINENESS MODULUS OF ORIGINAL AGGREGATE** 5.225

**FINENESS MODULUS OF ** **RE-CON ZERO** **AGGREGATE** 5.906

---

### DEVELOPMENT OF Rck – CONCRETE WITH COARSE AGGREGATES SUBSTITUTED WITH 50% **RE-CON ZERO**

**RE-CON ZERO aggregates** meet the requirements of **EN 12620:2008** “Aggregates for concrete”.

- Original aggregates
- **RE-CON ZERO aggregates**

---

**RE-CON ZERO aggregates** may be used to partially substitute coarse aggregates (up to 50%) in the production of concrete.

- Original aggregates
- **RE-CON ZERO aggregates**
HEADQUARTERS
MAPEI SpA
Via Cafiero, 22 - 20158 Milan
Tel. +39-02-37673.1
Fax +39-02-37673.214
Internet: www.mapei.com
E-mail: mapei@mapei.it