Additives and specialty resins sold under the TEGO brand support our customers to produce durable and resource efficient coatings. Thus our additives and specialty resins help modern coating systems to protect natural resources.

TEGO® Dispers wetting and dispersing additives promote pigment wetting and stabilization. They prevent floating, flooding and settling of pigments so that color coverage and intensity remain consistent during storage. At the same time, they ensure maximum color yield for the pigment while minimizing the number of milling steps.

This document provides the required Life Cycle Assessment data to give our customers the opportunity to calculate the environmental performance of their coating formulations.

Framework of the LCA

Goal: Calculating the environmental performance of the production of products sold under the TEGO brand.

System boundary: Cradle-to-Gate

Functional unit: 1 kg of TEGO® Dispers 653

Data sources: Primary data was used for the production process (average Evonik process data in the year 2012). Secondary data was used for raw materials (mainly GaBi 6 Database (PE International, Stuttgart, Germany). The software GaBi 6 was used for the LCA modeling.

Cut-off rules for the inventory: Below 1 % for single inputs and below 5 % for the sum. No environmentally relevant flows were neglected. Some utilities of production processes have been modeled analogue to known processes. Transports have been considered but distances have mainly been estimated. The result uncertainty in all categories is about ± 20 % as these results base on several assumptions.

Impact Assessment: The established method of the Dutch Environmental Science Research Centre Leiden (CML) with characterization factors from November 2010 was used.
### Results of the Life Cycle Assessment (Estimation, Cradle-to-Gate)

<table>
<thead>
<tr>
<th>Evaluation variables</th>
<th>Unit/kg product</th>
<th>TEGO® Dispers 653</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abiotic Depletion elements</td>
<td>kg Sb Equiv.</td>
<td>1.21 x 10⁻⁶</td>
</tr>
<tr>
<td>Abiotic Depletion fossil</td>
<td>MJ</td>
<td>25.09</td>
</tr>
<tr>
<td>Acidification Potential</td>
<td>kg SO₂ Equiv.</td>
<td>3.38 x 10⁻³</td>
</tr>
<tr>
<td>Eutrophication Potential</td>
<td>kg Phosphate Equiv.</td>
<td>1.08 x 10⁻³</td>
</tr>
<tr>
<td>Global Warming Potential</td>
<td>kg CO₂ Equiv.</td>
<td>0.97</td>
</tr>
<tr>
<td>Ozone Layer Depletion Potential</td>
<td>kg R₁₁ Equiv.</td>
<td>1.43 x 10⁻⁸</td>
</tr>
<tr>
<td>Photochem. Ozone Creation Potential</td>
<td>kg Ethene Equiv.</td>
<td>0.40 x 10⁻¹</td>
</tr>
<tr>
<td>Primary Energy Demand</td>
<td>MJ</td>
<td>25.62</td>
</tr>
</tbody>
</table>

**Contact**

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This LCA-estimation was performed by the LCM Group of Evonik Industries AG.

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