

Tensar Carbon Calculator

Introduction

The Tensar Carbon Footprint Calculator estimates the percentage carbon saving available by using Tensar TriAx reinforcement for ground stabilisation when compared with the construction of an equivalent unreinforced layer. This saving is due to the reinforcement enabling a lesser thickness of aggregate to be used in the construction.

The Tensar Carbon Calculator is not a design tool per se. It has been developed to complement Tensar Application Suggestions with information on the carbon emissions associated with reinforced and unreinforced ground stabilisation solutions. The calculator is intended for use only in conjunction with an Application Suggestion provided by Tensar.

Coffey Geotechnics was commissioned by Tensar International to develop the Carbon Calculator.

Methodology

The calculator follows the Carbon Footprint Measurement Methodology (Version 1.3, The Carbon Trust, 15th March 2007). The calculation of carbon savings considers and compares a reinforced solution and an unreinforced solution for a given set of input parameters. The boundaries of the calculation are:

- i) the embodied carbon within construction materials at their respective 'factory gates',
- ii) the delivery of materials to site, and
- iii) completion of construction of the stabilisation works.

Assumptions

The Tensar Carbon Footprint Calculator is based on the following assumptions:

General

- The user has a Tensar Application Suggestion for a stabilisation scheme, which provides the reinforced thickness, the number of layers of TriAx reinforcement required and the strength of the subgrade.
- Carbon emissions data is based on TriAx TX170.
- The equivalent unreinforced thickness is calculated based on the input data.
- The online carbon calculator assumes that deformation due to trafficking is limited to 40mm in accordance with TRL Laboratory Report 1132.

Construction

- Carbon emissions for the construction of reinforced and unreinforced layers are calculated separately and the percentage difference is presented to the user.
- TriAx is delivered from the Tensar plant in Blackburn, UK, to the site location chosen by the user (outward journey only).
- Quarried aggregate is delivered to the site from a quarry at a distance specified by the user (outward and return journey).
- Quarried aggregate is compacted in accordance with HA SHW Table 6/1 and Table 6/4.

Materials

- Embodied carbon in quarried aggregate is taken to be in accordance with University of Bath Inventory of Carbon and Energy (2006).
- Embodied carbon in TriAx TX170 is calculated in accordance with The Carbon Trust 'Measurement Methodology', including embodied carbon of polypropylene (100 year equivalent) in accordance with Plastics Europe Eco-profiles (2005).
- Embodied carbon and conversion factors for fuel consumptions and efficiencies are in accordance with Defra Conversion Factors (2005, 2007).
- Embodied carbon for container ship transportation and aggregate properties are in accordance with the Aggregain (WRAP) CO₂ Emissions Estimator Tool (2006).

Coffey Geotechnics Limited

Atlantic House Atlas Business Park Simonsway Manchester M22 5PR United Kingdom
T (+44) (0) 161 499 6800 F (+44) (0) 161 499 6802 www.coffey.com/geotechnics

Registered Office: 1 Northfield Road Reading Berkshire RG1 8AH United Kingdom
Registered in England No. 06328315 Vat Number: 638 923 407

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