Steintec®
paving systems

Low Energy Mortars

STRUCTURE FIRST

The global warming potential of Portland Cement is in the region of *856kg CO2 per tonne - very high by any measure. It is therefore imperative that the cement content of any mortar product is kept to an absolute minimum.

How do we achieve this?

"Structure First Principle"

Not all aggregates are created equal. Throw together a casual granular blend and the result is a lot of substance without much structure, that requires excessive cement binders to give it any strength.

At Steintec, we take a more scientific approach. Starting at the microscopic scale, we first ensure that the aggregates used in our bedding and jointing mortars follow the 'structure first principle'.

With the aid of laser scanning techniques, and scientific standards of quality control, the aggregates in our mortars are designed to lock together in a way that provides inherent strength before any binders are incorporated.

This natural interlocking or 'tessellation' - combined with the use of high grade, mineral rich, cementitious ingredients - means that our mortars require substantially less binders than other brands. The environmental benefits are significant.

*Mineral Products Association (MPA) Environmental Product Declaration - Average Portland Cement 05.02.14

STRUCTURE FIRST

Steintec mortars need less binders

LESS BINDER = LESS ENERGY

30-50%
LESS
BINDER

per tonne of mortar

***128kg**
CO2
SAVED

per tonne of mortar

*Global warming potential of Portland Cement = 856kg CO2 per tonne. Steintec mortars consume typically 15% (up to 50% of other brands) Portland Cement per tonne of mortar, compared to up to 30% for other brands. 856kg x 15% (50% of 30%) = 128.4kg CO2 per tonne.

tuffbed® 2-pack

"Rotary kilns represent the largest energy consumer and carbon dioxide emission source of the cement & concrete industry "

By separating the binder component from the overall mortar mix, considerable energy savings can be made by eliminating the requirement for kiln drying of aggregates.

Traditional ready mixed mortars are delivered to site with binder and aggregate combined, which must be bone dry to prevent the mortar from setting.

But with Steintec tuffbed 2-pack, the aggregate is packed separately from the mothermix binder, which eliminates the energy intensive requirement for aggregate kiln drying.

In fact, we ship our aggregates wet, which further reduces the need for excessive additional water in the final mix!

* US Department of Energy - report 29.12.03 Energy & Emission Reduction Opportunities for the Cement Industry

tuffbed® 2-pack

Steintec mortars need less drying (tuffbed 2-pack)

LESS DRYING = LESS ENERGY

*52% LESS ENERGY

required for kiln drying per tonne of mortar

**14kg CO2 SAVED

per tonne of mortar

* 80% of the aggregate component in tuffbed 2-pack is shipped separately. This represents 65% of the total combined mix for any job. 65% x 80% = 52%.
** Iain Gillespie 6 September 2012 - University of Strathclyde Department of Mechanical and Aerospace Engineering. Estimated 28.8kgCO2/tonne kiln drying of aggregates in an asphalt coating plant. 28.2kg x 52% = 14.66kg.

tuffbed® 2-pack

Stone aggregates are one of the most energy intensive commodities to ship

Sea freight is by far the most economical way to transport raw materials but still represents 10-15grams of CO_2 per km/tonne. With an inherently heavy commodity shipped over long distances, this soon adds up.

By separating the bulk of the aggregate component, and sourcing this locally to the construction site, an average of 31-46kgCO_2 per tonne can be saved.

tuffbed® 2-pack

Steintec mortars need less shipping (tuffbed 2-pack)

LESS SHIPPING = LESS ENERGY

*65% LESS SHIPPING

per tonne of mortar

**31-46kg CO2 SAVED

per tonne of mortar

*/** Based on 3000miles (4828km) average distance from Hamburg to port of delivery. Sea Freight 10-15grams CO2 per tonne per km (OECD Observer No 267 May-June 2008). Calc: 4828km x 10-15grams = 48-72kg x 65% (separated aggregate content of tuffbed 2-pack) = 31.2 x 46.8kg CO2 per tonne of mortar.

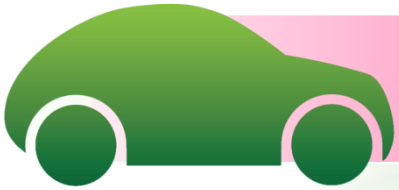
tuffbed® 2-pack

Overall potential savings

SAVINGS SUMMARY

*173-188kg CO2 SAVED

per tonne of mortar



173-188kgCO2 is equivalent to:

1348-1465km

distance travelled by the average car**

* Potential savings over rival pre-mixed brands. Example is per tonne of Steintec tuffbed 2-pack shipped 3000 miles from Hamburgh by sea, with aggregate sourced locally.

**smmt.co.uk (Society of Motor Manufacturers & Traders) 128.3g/CO2 per km average car in 2013

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