Edencrete®

Carbon nanotube-enriched liquid concrete additive

Uses

Edencrete® is used in ready-mixed concrete to enhance the performance of:

- Normal and special class concrete
- Precast concrete
- Self compacting concrete
- Infrastructures such as water distribution, bridges, dams, roads, ports
- Concrete pavements, commercial and industrial concrete floors, airport runways, driveways
- Concrete applications that are subject to abrasion
- Engineered structures where high steel content causes problems with concrete placement and consolidation.
- Concrete beams and suspended concrete decks
- Commercial and Industrial concrete floors

Advantages

Depending on the type of concrete mix design, concrete raw materials, application and related conditions the following can be achieved:

- Improves tensile and flexural strength
- Improves compressive strength
- Increases abrasion resistance
- Reduces concrete permeability
- Reduces shrinkage and cracking
- Reduces Chloride ion penetration
- Improves concrete durability and resistance to chloride ion attack, reducing the initiation rate of steel reinforcement corrosion
- Resistant to rapid freezing and thawing
- Potential for optimisation of concrete mixes to reduce depth dimensions or steel reinforcement requirements for on ground slab applications.
- **Edencrete®** reduces permeability of concrete and therefore has potential to prevent penetration by most chemicals.
- Can promote an increased life and reduction in maintenance life costs
- Excellent workability with minimal impact on concrete's fresh properties. Unlike synthetic macro fibres or topically applied finishing aids, **Edencrete®** works on the nano-level without any special finishing requirements or additional labour costs.
- Suitable for use in contact with potable water

Standards Compliance

Edencrete complies to AS 4020:2018 at an exposure level of 15,000mm² per litre; AWQC Report 314670.

Edencrete complies to AS1478.1:2020 as Type SN, Special purpose, Normal setting.

Copies of the test certificate are available upon request.

Description

Edencrete® is a carbon nanotube-enriched concrete liquid additive developed as a concrete performance enhancer. It contains millions of nanoscopic carbon cylinders, that elevate concrete structures to improved levels of strength and durability.

Carbon nano-tubes are strong, light and flexible and create enhanced bonds at the interfacial transition zone between cement paste and the aggregate.

Technical support

A technical advisory service is available for on site evaluation and advice on use of **Edencrete®** additive, dose rate determination, evaluation trials and dispensing equipment. Technical data and guidance can be provided for the additive and concrete admixture products, for use together with fresh concrete.

Properties

Typical values

Appearance:	Black liquid
Colour:	Black
Density at 20°C:	1.01 (± 0.02) kg / litre
pH value:	5.06 ± 1.0
Chloride content:	None added
TEA content:	Nil

Edencrete® has been tested in 3rd party laboratories according to various AS and ASTM Test Standards as set out below however actual results will vary depending on the concrete mix design being used.

Abrasion resistance:	MA20; ASTM C944; BS EN 13892-4
Compressive Strength:	AS 1012.9; ASTM C39
Flexural Strength:	AS 1012.11; ASTM C78
Modulus of Elasticity:	ASTM C469
Permeability - chloride ion:	NT Build 443; ASTM C1593
Tensile Strength:	AS 1012.10; NZS 3112; ASTM C496
Shrinkage:	AS 1012.13; ASTM C157
Rapid Freeze and Thawing	ASTM C666

Contact Parchem for further information.

Edencrete®

Application Instructions

To achieve maximum dispersion and efficiency, **Edencrete®** should be added as near to the end of the batch mixing process as is possible, after adding all of the raw materials and after the cement is wet out.

The addition of **Edencrete®** to dry materials in the mixer will impede performance and is therefore not recommended.

The addition of **Edencrete®** with the initial water and admixtures prior to raw materials is not the preferred batch sequencing.

If adding to a ready-mix truck after the batching sequence is completed (i.e. the truck has travelled), ensure a minimum of 70 revolutions at maximum rpm after addition of the **Edencrete®**, before placing the concrete.

For initial evaluations of **Edencrete®** into a new concrete mix, subtract the full weight of the additive dose from the design water and reserve an additional 2% of the remaining mix water. It may be necessary to add the entire amount of remaining mix design water to achieve the slump specification for the job, but some mixes are able to slightly reduce the water content and still meet the required slump.

When designing concrete, refer to the properties and typical dosage rate or contact Parchem for further advice.

Typical Dosage

For each application the dose rate of **Edencrete®** is best established by trial mixes with the same raw materials in use under conditions that will be experienced on site.

The typical dosage range is between 2 litres – 10 litres per m^3, depending on the specific mix design.

This will ensure the adequate concrete mixture proportions are consistent with the concrete properties needed. It is possible to exceed the recommended dosages with continued improvement to your concrete.

Laboratory and site trials are recommended to determine the actual dose rate.

For dosages outside of manufacturers recommendations, please contact Parchem.

Dispensing

The correct quantity of **Edencrete®** should be measured by means of a suitable dispenser.

Compatibility

With cements

Edencrete® is suitable for use with GP cement. Whilst the additive is compatible for use with supplementary cementation materials, performance enhancements with pozzolans are recommended to be determined by laboratory trials.

A combined dose of **Edencrete®** and **Edencrete® Pz**, added into the concrete mix separately, may be required for ultimate performance enhancement in pozzolanic combination concrete mix designs.

Please refer to the **Edencrete® Pz** TDS or contact Parchem.

With other admixtures

Edencrete® is compatible with most chemistry-type concrete admixtures commonly used.

It is recommended to conduct laboratory trial mixes with the same raw materials and concrete mix design.

Contact the Parchem for further advice on the compatibility of **Edencrete®** with various concrete admixtures.

Supply

Edencrete® 1000 litre IBC:	FC304110-1000L
Edencrete® 200 litre:	FC304110-200L
Edencrete® 19 litre:	FC304110-19L
Edencrete® 5 litre:	FC304110-5L

Shelf life

Edencrete® has a minimum 12 month shelf life from the date of manufacture, when stored, handled and transported per the guidelines.

Storage

Edencrete® products should be transported and stored at a temperature of 5 to 35°C). If allowed to freeze, the particles in **Edencrete®** will irreversibly precipitate. For bulk storage, the additive tank should be composed of plastic, polypropylene, high-density polyethylene, or fibreglass. The storage tank should be sealed after the **Edencrete®** is added. Do not store containers in direct sunlight.

Dispensing System Equipment for EdenCrete®

- Utilise pumps intended for low viscosity liquids, similar to water, with moderate microscopic solids content
- Utilise industrial rubber hose with EPDM, SBR, or PTFE liner material.
- Do not utilise dispensing equipment or recirculation equipment that is designed for or has been used to dispense **Edencrete® Pz**. The 2 products are not compatible to be mixed together in their liquid form and may reduce the shelf life of the stored product..

Recirculation Guidelines

Customer Location(s) with EdenCrete®

It is recommended to gently recirculate every two months if product has not been recently utilized. Recirculation is accomplished by:

- Recirculating a Tote (recommended method):
  - Utilize a small submersible pump (~50 to 60 litres/min)
  - Add t-fitting and bushings to obtain balanced, horizontal discharge.
  - Tether pump through the top of the tank using stainless steel cable & carriage bolt.
  - Suspend the pump with the discharge located completely below the top liquid surface, and the pump inlet ~300mm above the bottom of the tote.
- Do not draw material from the floor of the tote.
- Recirculate using the pump for 15 minutes every two months.

Recirculating a Tote (alternative method):

- Utilize a portable drill with a spiral stirrer that will only reach to the middle of the tote (~600mm) length.
- Stir the product for 15 minutes, moving the stirrer around to ensure the contents will be evenly mixed.

Recirculating a Tank (2000 – 10000 litres storage):

- Utilise a submersible pump (~200 litres/min).
- Add t-fitting and bushings to obtain balanced, horizontal discharge.
- Tether pump through the top of the tank using stainless steel cable & carriage bolt.
- Locate the pump at a depth ~300mm from the bottom of tank.
- Recirculate using the pump for 40 min every 2 months.

Recirculating a Tank (10000 – 20000 litres storage):

- Utilise a submersible pump (~200 litres/min).
- Add t-fitting and bushings to obtain balanced, horizontal discharge.
- Tether pump through the top of the tank using stainless steel cable & carriage bolt.
- Locate the pump at a depth ~300mm from the bottom of tank.
- Recirculate using the pump for 90 min every 2 months.

Small containers (4 litres to 20 litres):

- Gently turn or swirl the container to mix before use. Do not shake.

Health and Safety

Edencrete® contains no hazardous substances requiring labelling. For further information refer to the Safety Data Sheet.

Parchem Construction Supplies Pty Ltd
1956 Dandenong Rd, Clayton VIC 3168
AU 1300 737 787
www.edencrete.com.au ABN 80 069 961 968

Distributed in New Zealand by: Concrete Plus Ltd
150 Hutt Park Road Gracefield Ph: 0800 657 156
www.concreteplus.co.nz NZBN 9429033691282