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**AS1478. 1-2000: Chemical Admixtures for concrete, mortar and grout**
**Part 1: Admixtures for concrete**

# COMPLIANCE CERTIFICATE NUMBER 007

**PRODUCT NAME: EDENCRETE**
**Classified according to AS1478. 1-2000 as a type SN**
**Special purpose, normal setting**

**Tested by Parchem Construction Supplies Pty Ltd – Technical Laboratory Services**

The Test Report results per AS1478. 1-2000 Section 4 – Test Methods, clause 4.4.

***a) Admixture -***

(i)

| | |
|---|---|
| Manufactured by: | Eden Innovations LLC |
| Product Name: | Edencrete |
| Admixture Type: | SN |

(ii)

| | |
|---|---|
| Recommended dose rate range: | 2.5L – 10L per m3 |
| Test dose rate: | 5L |

(iii)

| | |
|---|---|
| Sample Size: | 176ml |
| Lot sample size: | 5L |

***b) Cement –***

*(i)*

| | |
|---|---|
| Manufactured by: | Cement Australia |
| Supplied: | January 2019 |
| Product Name: | General Purpose Portland Cement Type GP |
| Type: | GP |
| Source: | Gladstone |

*(ii)*

*Compound compositions tested to AS2350.2*

| | |
|---|---|
| Sulphuric Anhydride Content: $SO_3$ | 2.700 |

*(iii)*

*Compound compositions tested to AS2350.2*

| | |
|---|---|
| Mineral Additions: | |
| CaO | 0.641% |
| $SiO_2$ | 19.500% |
| $Al_2O_3$ | 5.000% |
| $Fe_2O_3$ | 3.200% |
| MgO | 0.900% |

*(iv)*

*Fineness tested to AS2350.8*

| | |
|---|---|
| Fineness: | 380m2/kg |

*(v)*

*Compound compositinos tested to AS2350.2*

| | |
|---|---|
| Sodium Oxide ($Na_2O$) content: | 0.600% |
| Potassium Oxide ($K_2O$) content: | 0.658% |

**c) *Aggregates –***

*(i)*

*Coarse Aggregates shall comply with AS2758.1*

| | |
|---|---|
| Geological Description: | |
| Coarse Aggregates 10mm and 20mm | Water warn lithic aggregate |
| Medium Aggregates 2mm – 5mm Manufactured | Crushed Quartz |
| Fine Aggregate 0.15-1.0mm Sand | Water washed Silica Sand |

*(ii)*

| | |
|---|---|
| Source & Supplier: | |
| Coarse Aggregates 10mm and 20mm | Dalswinton, O'Donohue Filter Sand and Gravel |
| Medium Aggregates 2mm – 5mm Manufactured | Boral Quarries, Southern NSW |
| Fine Aggregate 0.15-1.0mm Sand | Sibelco, Victorian and NSW Quaries |

*(iii) Particle Size Distribution –* ***percent retained***

| SIEVE SIZE mm | 20mm | 10mm | 5mm | 2mm | 1mm | 0.5mm | 0.3mm |
|---|---|---|---|---|---|---|---|
| 22.40 | 5.5 | 0 | | | | | |
| 19.00 | 20 | 1 | | | | | |
| 12.70 | 63.5 | 49.4 | | | | | |
| 9.50 | 10.4 | 47.1 | | | | | |
| 6.30 | 0.6 | 2.1 | | | | | |
| 4.75 | | | 1 | | | | |
| 2.80 | | | 52 | | | | |
| 2.00 | | | 40 | 18 | | | |
| 1.70 | | | 4 | 42 | | | |
| 1.40 | | | | 32 | | | |
| 1.18 | | | | 7 | 1.7 | | |
| 1.00 | | | | 1 | 9.5 | | |
| 425µm | | | | | 87.8 | 54.1 | |
| 300µm | | | | | 1 | 36.8 | 5 |
| 212µm | | | | | | 5.6 | 70 |
| 150µm | | | | | | 3 | 24 |
| 75µm | | 0.4 | | | | 0.5 | 1 |

*(iv):-*

*Moisture condition of Aggregates at time of batching:*

| | |
|---|---|
| Coarse Aggregates 10mm and 20mm | *Pre-dried 0.0%* |
| Medium Aggregates 2mm – 5mm Manufactured | *Pre-dried 0.0%* |
| Fine Aggregate 0.15-1.0mm Sand | *Pre-dried 0.0%* |

***d) Concrete Mix***

*Mixed according to AS1012.2*

| Test Date: 4-7-19 | **EdenCrete** |
|---|---|
| Amount of Admixture Used: | 176ml |
| Sequence of Addition: | Water, Admix, Cement, Fine Agg, Coarse Agg |
| Actual Cement Content: | 10.894kg 13.62% of powder |
| Water/Cement ratio Admix: | 0.486 |
| Water/Cement ratio Control: | 0.483 |
| Water content L/m3 | Control 153 EC 150.8 |
| Mass per unit volume kg/m3 | Control 2433 EC 2413 |
| Ratio of Fine Aggregate to Total Aggregate: | 0.413:0.587 |
| **ADDITION*** | |
| Water Reducer - Fosroc SP213 | 400ml/100kg cement |
| Amount of Admixture Used: | 43.5ml |
| *Edencrete is not a concrete admixture, rather a performance enhancing additive, that still requires admixtures in the concrete design. Therefore, testing to AS1478 was completed with a WR in both the control and test certificate mix. | |

***e) Fresh Concrete – (control concrete and concrete containing admixture)***

| Test | Specification | Control Sample | EdenCrete |
|---|---|---|---|
| Slump (mm) AS1012.3.1 | - | 80 | 80 |
| Air Content (%) AS1012.4 | Max +2% of Control | 2.3 | 2.3 |
| Bleed (%) AS1012.6 | - | 0.69 | 0.25 |
| Initial Set (hours) AS1012.18 | ± 1 | 3.3 | 3.7 |
| Final Set (hours) AS1012.18 | ± 1 | 4.6 | 5.4 |
| Water Content (% of control) | - | 100 | 99 |
| Water Content (L/m3) | | 153 | 150.8 |
| Mass per Unit Volume (kg/m3) AS1012.5 | | 2433 | 2413 |
| Shrinkage @ 56 Days (microstrain) AS1012.13 | - | 472 | 503 |

### *f) Hardened Concrete - (control concrete and concrete containing admixture)*

*Cured According to AS 1012.8*

*Compressive Strength (N/mm2) – MPa Tested According to AS 1012.9*

| Age | Control Sample | EdenCrete |
|---|---|---|
| 3 Day | 30.7 | 31.0 |
| 7 Day | 37.3 | 40.3 |
| 28 Day | 46.9 | 50.6 |
| 90 Day | 55.1 | 54.4 |

### *g) Comparison with specification*

| | Specification | Control Sample | EdenCrete |
|---|---|---|---|
| Water Content (% of Control) | report | 100 | 99 |
| Air Content (%) AS1012.4 | Max +2% of Control | 2.3 | 2.3 |
| Initial Set (hours) AS1012.18 | ± 1 | 3.3 | 3.7 |
| Final Set (hours) AS1012.18 | ± 1 | 4.6 | 5.4 |
| Bleed (%) AS1012.6 | - | 0.69 | 0.25 |
| Compressive Strength (min) as % of Control | | | |
| 3 Day | 90 | | 101 |
| 7 Day | 90 | | 108 |
| 28 Day | 90 | | 108 |
| 90 Day | 90 | | 99 |

### *h) Uniformity Tests*

| Uniformity Test | Method of Test | Result of Test | Manufacturers recommended Max. Variation |
|---|---|---|---|
| Determination of PH Value<br>*PH @ 25˚C* | APHA 4500-$H^+$ | 5.75 | 4.75-6.75 |
| Determination of relative Density<br>*Density @ 20˚C, g/m³* | Sharp & Howells In-House Density | 1.02 | 1.00-1.04 |
| Determination of non-volatile content<br>*Non-volatile content, %w/w* | Sharp & Howells In-House-Non-Volatiles | 4.5 | 3.0-6.5 |
| Determination of chloride ion content<br>*Chloride, as Cl, % w/v* | RMS T1014 | 0.013 | 0.01 – 0.03 |