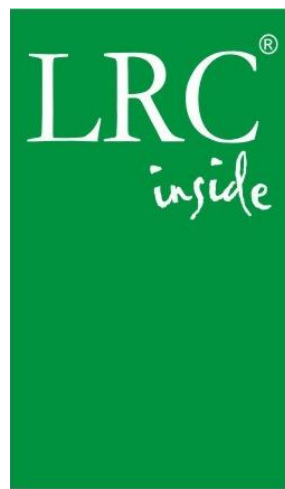


LRC[®]

LIGHTWEIGHT REINFORCED CONCRETE

SPECIFICATION



INTRODUCTION

LRC (lightweight reinforced concrete) product is an advanced technology in making all the decorative pre-cast architrave elements to external architectural design element.

The design and develop by **CSL Technologies (M) Sdn Bhd**, pre-cast **LRC** decorative product signify a new generation of lightweight concrete product made from “Green” material for the building industry. This revolutionary building material is from our R&D partnership between Malaysian and Australian experts.

With **LRC** products, the effectiveness not only in **COST SAVING, SPEED** but the main factor of **LIGHT WEIGHT** is improved.

In year 2009, LRC product is endorsed by the “Green Label” from Singapore Environment Council (SEC) for Green Labeling Scheme (SGLS) a certification given to environment-friendly products that also recognized by international Global Eco-Labeling Network (GEN).

Herewith our Standard Range of pre-cast **LRC** products which consists of two main categories: -

Architrave – For Building Product

- Cornices
- Copings
- Balustrades
- Window & Door Cornice
- Wall Capping or Panels
- Columns Cladding
- Keystone or Corbel
- Fencing Pier
- Arches
- Pedestals
- Pier Caps
- Bull-nose Step-treads

ArtStone® - For Landscape Product

- Planters & Pots
- Garden Ornaments
- Artificial Pond
- Fountain Components
- Pavers
- Decorative Art Panels



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SPECIFICATION

LRC product is a high performance of Cement based composite product. It consists of cellulose fiber that given flexural, tensile and impact strength. The cellulose fiber work with lightweight aggregate and admixture has an advantage of reduced density.

Autoclave used as steam curing process which high pressure (130psi) and high temperature (175°C) for 4 hours; to improve the **LRC** product physical characteristics and achieve early strength. The Autoclaving process changes the cement based product to a crystalline structure much stronger and more stable, further to expedite in delivery time compares to other conventional lightweight concrete technology products.

LRC products are non-combustible when used as surface decoration material with a flame-spread index of zero. It has achieved 3 hours fire rating test. (SIRIM. BS 475)

TYPICAL PROPERTIES (At 28 days)

Property	Autoclave Cure	Air Cure
Bending	5 - 8 Mpa	2 - 4 Mpa
Shear Strength	2 - 3 Mpa	1.5 - 2.5 Mpa
Compressive Strength	10 -15 Mpa	8 -10 Mpa
Impact Strength	6 - 12 KJ/m ²	5 - 10 KJ/m ²
Elastic Modules	10 – 20 Gpa	10 – 20 Gpa
Strain Failure	1-2%	1-2 %
Dry Density	1000 –1200 kg/m ³	1300 –1500 kg/m ³
Fire Resistance	3 hours	3 hours
Water Absorption	0.003ml/m ² /sec	0.003 ml/m ² /sec
M.O.R	19 Mpa	15 Mpa
Freeze Thaw (50cycles)	No deterioration	No deterioration

PROPERTIES

Material shall generally comply with relevant British Standards.

Cement	>35%
- Portland Cement	> 75%
- Flyash	> 25%
Fine Aggregate	>60%
- River Sand	> 35%
- Silica Sand	> 25%
Lightweight Aggregate	2~5%
- Cellulose Fiber	> 60%
- Polystyrene Chips	> 35%
- Perlite	> 5%
- Air Entraining Agent	
Water	>10%
Admixture	As required

CEMENT

The cement shall be Ordinary Portland Cement to BS 12 “Specification for Ordinary Portland Cement”. Fly ash is from coal burning waste ash which from coal burning power station and blended with cement.

SAND

Sand shall be washed river fine sand or dried silica sand free from soluble salts, clay particles and organic matter. The suitable composition is 90~95% silica, 2% maximum moisture, 1% maximum soluble salts, 0.5% maximum clay and organic material.

CELLULOSE FIBER

The cellulose fiber (waste paper pulp) shall be clean and free of lignin-based impurities with at least 20% of the fiber over 100mm square. The cellulose fiber or wood fiber which from waste paper (recycle paper) and it is serves a purpose similar to the reinforcing in reinforced concrete.

POLYSTYRENE CHIP

The polystyrene beads or chips (recycle from polystyrene foam waste) shall be clean and CFC free. Mainly to added in the lightweight concrete is to reducing the density and achieved a constant density require in the concrete. However it gives a very good thermal insulation if apply to wall panel.

WATER

The water shall be clean and free from deleterious matter. In general, water suitable for drinking should be adequate. Where tests are required, they shall be done in accordance with the requirements of BS 3128 “Methods of Test for Water for Making Concrete.”

PERFORMANCE

REINFORCEMENT

The bamboo strips are using to replace steel bar as reinforcement. Even for small or large element we shall cast-in during production process in place. Where the size shall be 1/8 of the bamboo diameter or 20mm wide splints are used, they shall be done in accordance with the requirements as **tensile element in concrete design**.

The use of bamboo as reinforcement in Portland cement precast concrete elements has been used as a construction material in certain areas for centuries, feasibility of replacement bamboo as the reinforcing material in precast concrete elements was conducted at the U. S. Army Engineer Waterways Experiment Station in 1964.

SHAPE / DESIGN

The element designs are to be formed in precast **LRC** to achieve whatsoever profiles indicated by the Architect’s drawings. Sometimes, client requested for individual design for their building. With special design and difference moulding has to be made.

FINISH

The **LRC** products are all produced in composite cement finished as specified by the Architect and as shown in the drawings. The surface will be received paint finish or any optional. Sometime, architect or client could select any acceptable variation in texture, color and appearance on the range of finish.

DEFECTS

The finished **LRC** products shall be as free as possible from surface imperfections such as blowholes, voids and ridges or any other defects that is visible on the end product when inspected from an appropriate distance. It could be fixed and repaired always.

STAINING

Any dirt on the **LRC** product due to storage, handling, transportation, and erection shall be removable. To facilitate, the products may be given a water-repellent treatment or upon request.

WATER PENETRATION

The **LRC** products shall not allow water to penetrate through the thickness of the elements so that dampness will not occur on the inside face. Surface protection coat to be applied with painted or water proofing treatment immediately after installed.

FIRE RESISTANCE

The **LRC** products are non-combustible and meet the requirements of BS 476, Parts 4 “Fire Tests on Building Materials and Structures:” or BS E15, ASTM E136 when used as surface material, its flame spread index of zero and less than 5 smoke density.

THERMAL INSULATION

The **LRC** wall panel or block products shall be at 1.0 to 0.75 btu/in./hr/ft²/deg.F in accordance with British Standard.

*Note: Thermal insulation property of LRC is higher than GRC product and lighter in density.

GUARANTEE / WARRANTY

CSL Technologies (M) Sdn Bhd stands by the quality and workmanship of its complete range of products. Every stage of production has on-going quality controls in place. All products are manufactured to and exceed Malaysia and Australia Standards therefore no expressed guarantee or warranty are given. Manufacturer's liability is limited to replacement of product if inspected before installation. Products are supplied according to **LRC Tech (M) Sdn. Bhd** standard “Terms & Conditions of Sale”. However, AIG General Insurance (M) Berhad will insure for Comprehensive General Liability Insurance for limit of indemnity of RM 0.5million.

CARE & MAINTENANCE

LRC products are the closest representation to stone and will perform similarly to natural stone. The unique natural sandy texture requires care and attention. Unsealed and over a period of time, mould growth can appear, slight salts could rise to the surface and stains of general wear might become apparent. A professional sealing, painting and cleaning regime will prolong the “new look” with recommendations of proper waterproofing or others chemical applied.

EXTRAS

LRC delivers with its exclusive quality products, matching service and technical support. We can help transform your original architectural designs into one-off customized moulded products. Matching colours and design mixes are also available for a complete project. We also have given our maintenance team to serve you or your client after liability period services.