



# DINCEL STRUCTURAL WALLING

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7 GREEN STAR FOR YOUR NEXT PROJECT



The Australian Green Building Council (GBCA) – Green Star rating tool considers the following topics.

- Materials
- Innovation
- Energy
- Indoor Environment Quality
- Emissions
- Transport
- Water Conservation
- Management
- Land Use and Ecology

Construction **workplace safety** and **food conservation** would also be appropriate to be added to the above list as these items are equally important.

**Your project receives positive credits towards the Green Star rating depending on how the above topics are addressed.**

The type, use and functionality of a construction material directly affects any of the above topics. For example, the most commonly used construction material, concrete, is vulnerable to durability problems, and is weak against tensile forces, (i.e. brittle, its formwork always has safety concerns). These weaknesses in concrete directly relate to the majority of the above topics.

**DinCEL Construction System (DCS), which consists of polymer permanent formwork infilled with concrete, offers a variety of solutions in the abovementioned Green Star topics.**

This document explains in brief how to improve the environmental performance of your project by engaging DCS.

The reader may refer to the following document for a detailed explanation.

[\(Download – Sustainability for the Construction Industry\)](#)

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The information contained in this document is intended for the use of suitably qualified and experienced architects and engineers and other building professionals. This information is not intended to replace design calculations or analysis normally associated with the design and specification of buildings and their components. The information contained in this document is not project specific. Building professionals are required to assess construction site conditions and provide design/details and appropriate safe work method statements accordingly. DinCEL Construction System Pty Ltd accepts no liability for any circumstances arising from the failure of a specifier or user of any part of DinCEL Construction System to obtain appropriate project specific professional advice about its use and installation or from failure to adhere to the requirements of appropriate Standards, Codes of Practice, Worker Health & Safety Act and relevant Building Codes.

## MATERIALS

### PVC USE

The PVC industry, particularly in Australia, has changed significantly in the last five (5) years. The innovations in material science and manufacturing technology now offer superior sustainability solutions to the satisfaction of green buildings.

**Under the revised credit that was announced on 15th January 2010 by the GBCA, projects in Australia will be able to claim positive credits for the Green Star Rating where PVC production and use meet the GBCA's Best Practice Guidelines.**

DCS has adopted its environmental practices which exceed the currently announced GBCA's Best Practice policy since its commercialisation in 2006, to provide a safe, fast and economical building solution whilst addressing green concerns.

DCS is free of heavy metal free stabilisers, plasticisers and VOCs (below detection level) and allows 100% recyclability during manufacturing, construction and end of life cycle.

### CEMENT MINIMISATION

The Australian Engineering Codes require high usage of cement for DURABILITY reasons. For example, 40 Mpa concrete is required in coastal zones for durability reasons. If durability was not an issue, the concrete strength of 10Mpa for walls under axial compression load would be adequate for up to 10 storey buildings.

Being **WATERPROOF** ([Download – Waterproof Walls](#)) Dincel-Wall eliminates the durability requirement of concrete, thus 50% of Portland cement and 50% of conventional aggregate use can be reduced with the use of fly ash where Dincel Construction System is used.

For further information: ([Download – Dincel-Sustainable Concrete](#))

### STEEL MINIMISATION

The most abundant construction product is concrete which requires steel reinforcement for flexural strength and crack control.

The walls under axial compression load do not need steel reinforcement for strength purposes. The load is then carried by concrete in compression. Dincel-Wall totally eliminates the need for crack control steel reinforcement normally required for concrete walls (certified by the University of New South Wales). ([Download – Common Engineering Questions – Refer Items 1, 2, 4 and 11](#)). This would equate to 90% reduction of steel bars in walls under axial compression loads.

## INNOVATION

Dincel Construction System assists sustainability in the following ways.

1. Patented snap-on technology connects each Dincel permanent wall formwork modules to each other. This ensures waterproofing ([Download – Waterproof Walls](#)) which results with the solution to durability. This achieves the following in concrete walls:
  - Steel and cement reduction.
  - Elimination of concrete cancer and steel corrosion, and increased building life.
  - The re-use of recycled and crushed concrete in structural concrete making.
  - The safe installation, even by low skilled labour, with light weight panels, without scaffolding and craneage.
2. Dincel – Manufacturing Technology achieves zero wastage with its automated recycling system and provides as per order lengths of the product to construction sites, thus reduces construction wastage.

The system allows 100% recyclability of both steel, concrete and PVC at the end of its life cycle for the majority of building walls. ([Download – Sustainable Construction](#)) – refer to pages 4 and 7.

3. Dincel – Specially Formulated PVC material:
  - Does not contain toxic heavy metals stabilisers or plasticisers, approved by WorkSafe Australia.
  - Superior fire properties, Group 1 material, smoke index better than the BCA threshold certified by the CSIRO – ([Download – Dincel Wall Fire Assessment](#)).
  - Volatile Organic Compound (VOC) below detection level (certified by CETEC).

## INDOOR ENVIRONMENT QUALITY

The indoor environment quality of a building is compromised due to the ingress of pollutants, gasses, pests, moisture (mould, mildew) and bacteria in the building's interior (because of wall cracking, joints in façade walls and the use of porous materials).

Dincel-Wall does not crack, cannot be damaged by water and does not allow external contaminant ingress (waterproof as tested by the CSIRO) into the building's interior.

Dincel-Wall is the only wall system with an in-built permanent waterproof/impervious vapour barrier on both faces of the wall.

([Download – Indoor Air Quality, Condensation, Mould and Mildew](#))



## ENERGY

### OPERATING ENERGY

Lower operational energy use for cooling and heating can be achieved by providing insulated façade walls. Insulation at the façade walls can only be useful if the walls are air tight which is unlikely with the majority of conventional walls, due to their porosity, wall cracking and wall joints. Air leaking walls cause 25% increase in cooling and heating energy use.

DinCEL-Wall is air tight (i.e. waterproof), does not crack, is impervious and does not require joints, thus assisting the insulation material in achieving its full effectiveness.

DinCEL-Wall offers significant thermal mass and a high 'R' value for the reduction of cooling and heating energy.

[\(Download – Part 2 Energy Efficiency for Building Operational Use\)](#)

### LOW EMBODIED ENERGY USE

DCS offers low embodied energy use which is significantly lower than the total operational energy use (i.e. heating, cooling, hot water, and lighting) in buildings.

DCS's embodied energy study has been peer reviewed by the Swinburne University of Technology which confirms that DCS reduces 70% embodied energy use compared to conventional construction systems.

[\(Download – Part 1 Energy Efficiency in Building Construction – Embodied Energy\)](#)

## EMISSIONS

The CO<sub>2</sub> produced for the production of building materials is significantly higher than the CO<sub>2</sub> due to building operational energy use.

The Swinburne University of Technology peer study confirms that DinCEL Construction System results in 62% less CO<sub>2</sub> emissions in comparison to conventional building systems.

[\(Download – Part 1 Energy Efficiency in Building Construction – Embodied Energy\)](#)

## WATER CONSERVATION

DinCEL – Patented Water Conservation System offers up to 90% water sustainability and 1:500 year flood mitigation simultaneously as confirmed by the Upper Parramatta River Catchment Trust's experts.

[\(Download – Water Conservation\)](#)

## TRANSPORTATION

DinCEL-Walls are lightweight. A full semi trailer load is less than 6 tonnes. This achieves less fuel use and less damage to road infrastructure.

## MANAGEMENT

DCS achieves total construction management when it is used as a load bearing wall system in lieu of columns and infill walls in multi-level constructions (especially residential, hotel, accommodation types of structures).

The main formworking-concreting trade can finalise the main construction skeleton using load bearing DinCEL-Walls. DCS is not affected by wet weather conditions and allows water reticulation, electrical services, windows and finishes to be installed without any interference to the formworking and concreting trade. This way, a more efficient construction time management is achieved.

## LAND USE AND ECOLOGY

- DinCEL – Water Conservation Solution replaces the conventional on-site detention systems normally used to cater for flash storms. The detention systems, either above or below ground results in significant tree and fauna lost in any construction.
- DinCEL – Water Conservation Solution significantly reduces water intake from waterways. Thus, assists ecological problems due to reduced water demand from the waterways.
- DinCEL-Wall is a solution for:
  - Below ground barrier to stop contaminated water, petroleum, chemicals leaching to waterways (i.e. waterproof and a minimum of 120 years life).
  - Offering a variety of solutions to combat acid sulphate soil ([\(Download – Acid Sulphate Soil Damages\)](#)) and salinity conditions.

## FOOD CONSERVATION

The current grain storage life is three (3) months.

DinCEL – Food Conservation System can increase grain life in excess of twelve (12) months, hence the solution for famine and wastage of food stocks.

[\(Download – DinCEL Silos for Food Conservation\)](#)

## CONSTRUCTION WORKPLACE SAFETY

The snap-on technology ensures that the fastest and safest way of installation is achieved.

Refer to the following for a detailed explanation:

[\(Download – DinCEL Solution for Construction Safety\)](#)

[\(Download – DinCEL Solution for Construction Problems\)](#)

[\(Download – FAQ, General Questions #4\)](#)