

# HIGH PERFORMANCE (HP) ASH

featuring GREENCEM™ technology

Cement Australia's High Performance (HP) Fly Ash is a supplementary cementitious material (SCM) that enables reduced CO<sub>2</sub> in concrete through increased replacement of GP Cement, without compromising strength performance.

HP Ash is a premium fly ash that fully complies with the requirements for Grade 1 Fly Ash in Australian Standard AS3582.1 – *Supplementary cementitious materials for use with General Purpose and blended cement*.

In addition to the benefits of Grade 1 Fly Ash such as improved later-age strength, workability and enhanced durability, HP Ash also provides low drying shrinkage and high early age strength.

HP Ash is suitable for premixed and pre-cast concrete applications.

- ✓ Reduces embodied CO<sub>2</sub> in concrete without compromising strength performance
- ✓ Sourced within Australia and reduces landfill waste
- ✓ Improves early age strength and drying shrinkage



## Enabling Low Carbon Concrete Mixes

Based on AusLCI intensity factors (Table 1), the embodied carbon of GP Cement is nearly 50 times that of Fly Ash.

Until now, the downside of replacing a significant proportion of GP cement with Fly Ash has been reduced concrete performance.

**Table 1: Intensity factors. Life Cycle Inventory (LCI) Stages A1-A2.**  
taken from Infrastructure Sustainability Materials Calculator V2.0.13 (LCI 2021)\*

Name	LCI Source	Global Warming Potential (kg CO <sub>2</sub> e/tonne)
Cement	AusLCI	966.9
Coarse Aggregates (Gravel, crushed)	AusLCI Shadow Database	10.5
Fine Aggregates (Sand)	AusLCI Shadow Database	4.2
Fly Ash	AusLCI	19.8
GGBF Slag	AusLCI	192.2

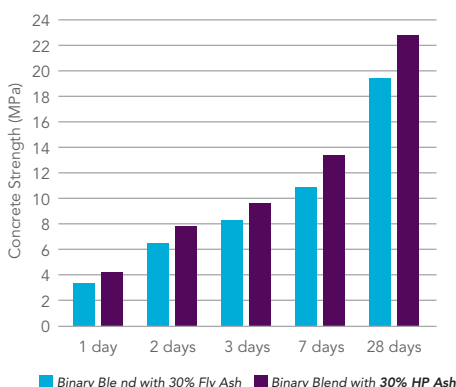
Cement Australia's HP Ash, featuring GREENCEM™ technology, enables higher levels of cement replacement, whilst maintaining or improving concrete performance relative to conventional concrete mix designs.

Replacement of 40% HP Ash in binary blends provides an embodied carbon reduction of greater than 40% relative to GP Cement<sup>^</sup>.

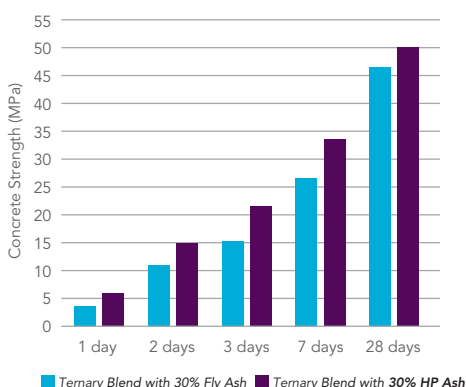
In ternary blends, where HP Ash is used in combination with Ground Granulated Blast Furnace (GGBF) Slag, even higher levels of cement replacement in concrete are achievable whilst maintaining or improving concrete performance relative to conventional concrete mix designs.

A combination of HP Ash and Slag can achieve up to 80% cement replacement, which provides an embodied carbon reduction in concrete of up to 70% relative to GP Cement.

**20MPa Binary Blend**  
(70% GP Cement, 30% Ash)



**40MPa Ternary Blend**  
(40% GP Cement, 30% Slag, 30% Ash)



Data provided in these graphs was achieved by testing conducted in a controlled laboratory environment using Australian Standards test methods at a NATA registered laboratory. Graphs should be used as an indicative guide only as various factors can impact final strength results in field trial conditions.

\* Source: "Supplementary Cementitious Materials" May 2024 - Dept of Climate Change, Energy, the Environment and Water, NSW

<sup>^</sup> based on AusLCI intensity factors. Source: <https://www.auslci.com.au/index.php/EmissionFactors>

GREENCEM™ Technology, inclusive of HP Ash, HP Slag and HP GB, is only available in select locations, as a component of a broader cementitious offering. Prior to supply, Cement Australia's technical team is required to conduct a technical assessment of the existing mix design, to determine the suitability for the application.

Fly Ash is a by-product of coal combustion in power stations.

It is commonly used as a 20% – 30% cement replacement in concrete in virtually all conventional concrete applications.

**Cement Australia's HP Ash is sourced exclusively from Australian power stations**, making it the the best choice for reducing CO<sub>2</sub> in concrete, whilst reducing waste going to landfill.

## KEY BENEFITS of Cement Australia's HP Ash

- ✓ Enables a significant reduction of embodied CO<sub>2</sub> in concrete through increased replacement of GP Cement
- ✓ Reduces waste going to landfill
- ✓ High early strength development compared with standard Fly Ash
- ✓ Reduced efflorescence
- ✓ Lower drying shrinkage
- ✓ Enhanced durability and workability
- ✓ Improved resistance to chemical attack and chloride penetration
- ✓ Reduced potential for Alkali Aggregate Reactions (ASR)

To find out if High Performance (HP) Ash is suitable for your project, please contact the Cement Australia Technical Team

[cementaustralia.com.au](https://cementaustralia.com.au) or call 1300 CEMENT (1300 236 368)

