

Safety and Ordering

SAFETY

Avoid direct skin contact with both wet and dry cement. Avoid breathing cement dust by wearing a P1 or P2 dust mask suitable for airborne dust. Wear appropriate protective clothing and footwear.

Additional information is available in our Material Safety Data Sheets, on request.
Phone 1300-138-996.



FIRST AID

In the event of skin contact wash with clean water to minimise possible irritation. If material gets into eyes wash immediately and repeatedly with eye wash solution or clean water.

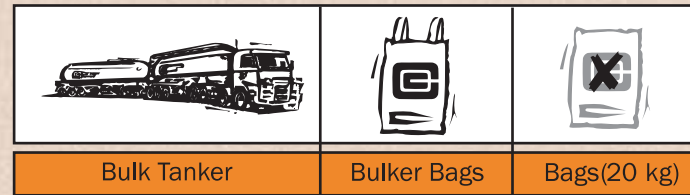
NEED TECHNICAL HELP?

For more information contact Technical Support on our free-call-help-line 1300-138-995 or visit our website www.cockburncement.com.au

SALES AND ORDERING:

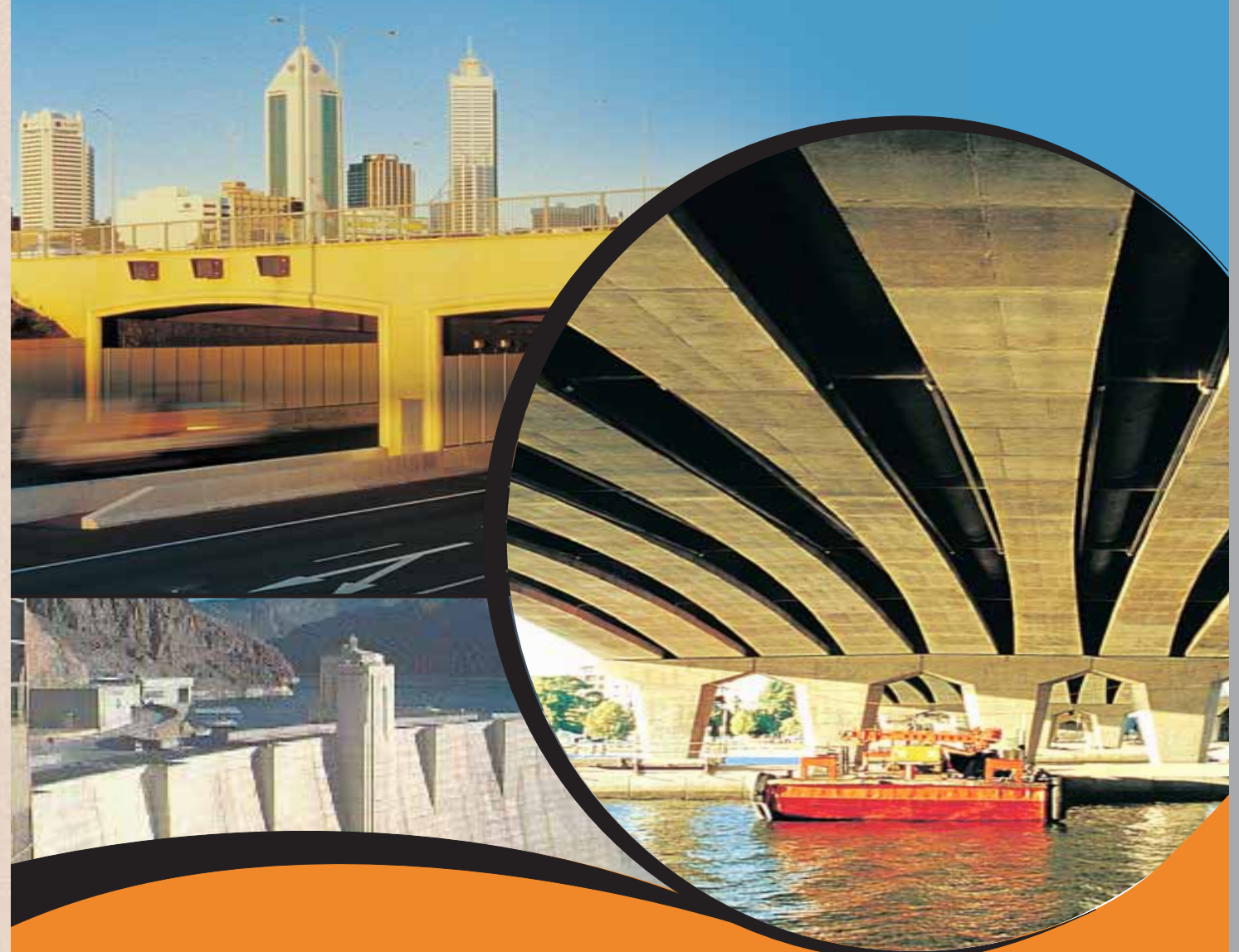
Customer Service Centre:
(08) 9411 1166

Microsilica Cement Is Available In



ABN 50 008 673 470
Lot 242 Russell Road East,
Munster Western Australia 6166
PO Box 38, Hamilton Hill WA 6163
Telephone: (08) 9411 1111
Facsimile: (08) 9411 1120

Cockburn Cement Microsilica Cements



PRODUCT INFORMATION



COCKBURN MICROSILICA CEMENT MGP, MLH & MHE

PRODUCT INFORMATION AND PROPERTIES

“Microsilica Cements” – Are a range of cements specially designed to enable high durability concretes to be produced.

Cockburn Microsilica blended cements are a blend of carefully selected, high quality, undensified silica fume and Cockburn Portland Cements. The fineness and purity of the selected undensified grade of microsilica, typically 0.15 microns and 95% SiO₂, offers the well proven pozzolanic benefits of slag and fly ash but at a much earlier age and at significantly lower replacement levels. The ultra fine particles of this particular grade of silica fume when intimately pre-blended with Cockburn Portland Cements enable the full advantage of microsilica’s “super-pozzolancity” to be realised.

Microsilica cements in fresh concrete provide improvements in workability, density, pumpability, cohesion, adhesion, and reduces bleed. In hardened concrete, microsilica benefits can be listed as; increased abrasion resistance, improved impermeability and a very fine surface finish. Improved impermeability also increases the durability of concrete in adverse environments. The addition of microsilica therefore has proven benefits for concrete structures subjected to severe environmental attack, such as aggressive ground conditions, marine exposure and sulphate attack.

Microsilica cements, in particular MHE and MGP, are also beneficial in producing concretes of high strength both at early and later ages. As such, these two are ideally suited for use in pre-cast and/or pre-stressed concrete production where early high strength is essential. Equally they can be used to great effect for in-situ concrete where both high early and final strengths are critical, such as high-rise construction. Here the additional benefit of improved pumpability and cohesion can be a tremendous aid to the ease and speed of construction.

Microsilica cements such as MGP have also been proven to be particularly beneficial for shotcreting primarily by virtue of this improved cohesiveness significantly reducing rebound, as well as producing excellent strengths.

In addition to many other high strength applications, microsilica cements can be ideally suited for both the production of lightweight concrete and for placing concrete under water.

Mix	Concrete Use		
A	High strength structural mixes: precast concrete and heavy duty floors		
B	General structural concrete: paths, driveways, garage floors.		
Parts by Volume			
Mix	Cement	Concrete Sand	Aggregate
A	1	1.5	3
B	1	2	4
Quantities to make One Cubic Metre of Concrete (1m ³)			
Mix	Cement (kilograms)	Concrete Sand (m ³ estimate)	Aggregate (m ³ estimate)
A	400	0.4	0.8
B	280	0.5	0.8

Available as

Cockburn Microsilica General Portland Cement – Type MGP
9% undensified micro silica and 91% Type GP cement

Cockburn Microsilica Low Heat Cement – Type MLH
7% undensified micro silica and 93% Type LH cement

Cockburn Microsilica High Early Cement – Type MHE
8% undensified micro silica and 92% Type HE cement

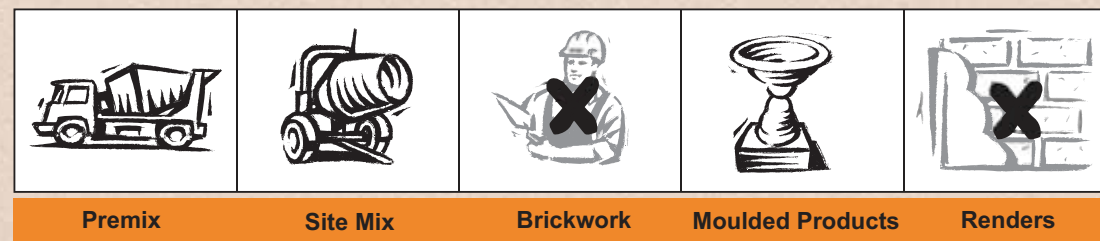


Chemical Properties

Parameter	MGP Typical	MLH Typical	MHE Typical	AS-3972-1997 Limits	Test Method
SiO ₂	27.6%	32.8%	27.1%	N/A	XRF
Al ₂ O ₃	5.2%	10.2%	4.3%	N/A	XRF
Fe ₂ O ₃	2.4%	1.4%	2.6%	N/A	XRF
CaO	57.4%	46.7%	59.6%	N/A	XRF
MgO	2.4%	3.9%	2.4%	N/A	XRF
SO ₃	2.3%	2.4%	2.7%	3.5% Max	XRF
LOI	1.8%	1.2%	1.7%	N/A	AS2350.2
Chloride	0.01%	0.01%	0.01%	N/A	ASTM C114
Na ₂ O equiv.	0.45%	0.35%	0.25%	N/A	ASTM C114

General Notes

- Use only recommended concrete sands free from clay and organic contamination.
- Use a 50/50 blended 20mm + 10mm stone for concrete aggregate.
- Keep water content down to the minimum required for mixing and placing. The more water, the lower the strength. Use a standard sized vessel eg., a bucket, to measure all materials.
- Admixtures should only be added in accordance with the manufacturers recommended dosages and specifications.
- Quantities estimated are typical industry usage and will vary according to individual use patterns.
- For additional DIY information please refer to www.concrete.net.au.



Physical Properties

Parameter	CCL Typical			AS3972 Limits				Test Method
	MGP	MLH	MHE	GP	HE	LH	SR	
Fineness Index	640 m ² /kg	580 m ² /kg	650 m ² /kg	N/a	N/a	N/a	N/a	AS2350.8
Normal Consistency	30.9%	31.5%	30%	N/a	N/a	N/a	N/a	AS2350.3
Initial Set Time	180 mins	240 mins	120 mins	0:45 hours:mins Min				AS2350.4
Final Set Time	240 mins	360 mins	180 mins	10:00 hours:mins Max				AS2350.4
Peak Heat of Hydration	N/A	20°C	N/A	N/a	N/a	23C	N/a	AS2350.7
Soundness	1mm	1mm	1mm	5mm Max				AS2350.5
Sulphate Expansion	300µs	250µs	N/A	N/a	N/a	N/a	900µs	AS2350.14
ISOCEN Mortar Bar Strengths								
3 Day	34 MPa	16 MPa	37 MPa	N/A	20	N/A	N/A	AS2350.11
7 Day	46 MPa	31 MPa	49 MPa	25	30	10	15	AS2350.11
28 Day	66 MPa	53 MPa	67 MPa	40	N/A	30	30	AS2350.11