

CIVILOX EPOXY PRIMER

APPLICATION REPORT Oily Concrete Adhesion



OBJECTIVE

To evaluate the adhesion of Civilox Epoxy Primer when applied over oil-contaminated concrete.

APPLICATION

Table 1. Concrete Properties

Substrate	Concrete Paver
Size	8"x4"x2"
Surface	Shot Blasted

Oily Concrete Properties

We applied two types of used engine oil to the top of the concrete block. The two oils used were from diesel and petrol cars. The diesel oil (very dark) was synthetic. The used petrol engine oil composition was standard grade. The oils were allowed to remain on the concrete surface for 7 days before coating with Civilox. No attempt was made to clean the concrete surface after the oil application. The concrete surface was oily but not wet.

We allowed the Civilox coating to cure for 7 days before adhesion testing.

Image 1. Before Civilox application



Diesel
engine oil

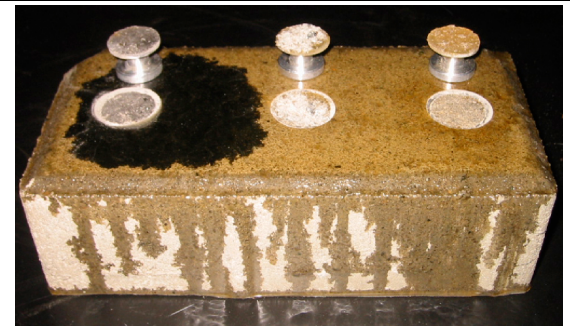
Area free
of oil

Petrol
engine oil

TESTING

Positector dollies were attached (Araldite 2011) to the Civilox coated surface. The dollies were allowed to cure for 48 hours before adhesion pulls were made. Before testing, the circumference of the dolly base was cut with a bi-metal hole cutter through the primer and into the concrete to ensure accurate adhesion values.

Table 2. Oily Concrete Adhesion Pictures



2.76 Mpa	4.14 Mpa	4.13 Mpa
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Table 3. Adhesion Values (all testing @23C°)

	Diesel Engine Oil	Bare Concrete	Petrol Engine Oil
7 day adhesion	2.76 Mpa	4.14 Mpa	4.13 Mpa
Rupture mode	Concrete	Concrete	Concrete

CONCLUSIONS

Civilox exhibits excellent adhesion over oily concrete. The lower adhesion value over the diesel engine oil may represent a lower penetration of the coating into the concrete.

CIVILOX EPOXY PRIMER

APPLICATION REPORT Wet & Green Concrete Adhesion



OBJECTIVE

To evaluate the adhesion of Civilox Epoxy Primer when applied over green and wet concrete.

DAMP CONCRETE BLISTERING TESTS

- Two concrete blocks were immersed in tap water
- After 2 weeks, excess water was removed and the edges and top side coated with Civilox (300 µm DFT)
- Civilox clear formulation was used
- Immediately after application of Civilox, both concrete blocks were partially immersed in water and exposed to the following cycle:
 - 8hr exposure to IR-lamp (150W) 30cm above concrete block
 - 16hr without IR-lamp

No osmotic blistering was observed for either coatings after three months of exposure when tests were stopped.

DAMP CONCRETE ADHESION

- Two concrete blocks immersed in tap water for 24hrs, then freestanding water on the top was removed by blotting with paper towels
- Civilox was applied with a ¼" nap roller with a front-to back and side-to-side pattern. After 5 minutes, another layer was applied with a drawdown bar to ensure 250 µm DFT.
- Tufflon polyurea top up coat was spray-applied 18 hours after Civilox application.
- Positector dollies were attached (Araldite 2011) to the cured film surfaces after 24hr cure. The dollies were allowed to cure for 24 hours to 3 weeks before adhesion pulls were made.

	24 hr. Cure	3-week Cure	
	Dry Concrete	Dry Concrete	Damp Concrete

Civilox	6.9 MPa	6.9 MPa	4.1 MPa	3.4 MPa	3.4 MPa
Rupture Mode	50% concrete 50% Dolly to adhesive	Dolly to adhesive	50% concrete 50% Dolly to adhesive	100% concrete	100% concrete

Liquimix Pty. Ltd.

1/29 Collinsvale St, Rocklea, Queensland 4106, Australia

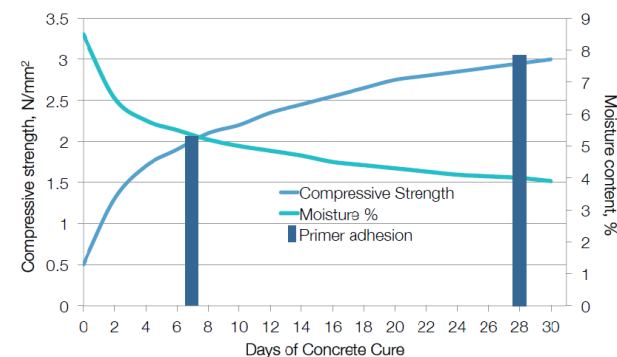
Tel (07) 3277 6655 Fax (07) 3009 0558 www.liquimix.com

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GREEN CONCRETE ADHESION

Concrete requires 28 days to fully cure, but Civilox epoxy primer can develop good adhesion with concrete after 7 days as shown in graph below.



CONCLUSIONS

- Civilox, 100% solids, low viscosity, solvent and benzyl alcohol free epoxy primer exhibits long pot life.

- Civilox is available in 100% solids (1:0.8 mix ratio) and 92.5% solids (1:1 mix ratio) offering many benefits:
- Very fast cure even at low temperatures
- Excellent film appearance
 - Fast hardness development
 - Excellent adhesion to oily concrete
 - Excellent adhesion to green, damp and dry concrete
 - Combination of high hydrophobicity, low permeability and excellent adhesion that prevents osmotic blistering.