



Conducrete®: *A safe and reliable
approach to grounding*

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Introduction

SAE's Conducrete[®] is a conductive cementitious and carbonaceous material that dramatically enhances the performance, reliability and longevity of grounding and cathodic protection systems. Engineered to protect ground electrodes and reduce material costs; SAE's Conducrete[®] is a long-term solution that virtually eliminates corrosion, ensures long-term reliable grounding and serves as a theft deterrent.

Also, the conductive backfill can store and release energy the same way that a capacitor will store energy until it is grounded or allowed to release the energy into a circuit. The material absorbs high rise time electrical surges keeping ground potential rise in check and preventing damage.

Key Benefits:

- Extends the life of grounding and cathodic protection systems
- Low impedance electrode enhances lightning protection
- Theft resistant and requires minimal maintenance – once set
- High water absorption due to constant hydration
- Environmentally friendly
- Withstands high fault current

Refer to Table 1 for an overview of the physical properties of the Conducrete[®] conductive backfill:

Table 1: Physical Properties

Property	Typical Value	Unit	Test Method
Dry Density (powder)	1021 63.7	kg/m ³ lbs/ft ³	SAE Inc. Standard 106 (dependent on compaction)
Wet Density (hardened state)	1730 108	kg/m ³ lbs/ft ³	SAE Inc. Standard 106
Slurry Density (3 US Gallons/55 lb bag)	1529 95.4	kg/m ³ lbs/ft ³	SAE Inc. Standard 106
Dry Volume (powder)	0.023 0.802	m ³ /55 lb bag ft ³ /55 lb bag	SAE Inc. Standard 106
Slurry Volume	0.025 0.886	m ³ /55 lb bag ft ³ /55 lb bag	SAE Inc. Standard 106
Hygroscopic Property (Water Absorption)	25.4	%	SAE Inc. Standard 110
Water Permeability	2.0 x 10 ⁻⁸	cm/sec	ASTM 5084 (2.6 psi)
Electrical Corrosion Resistance			SAE Inc. Standard 100
Copper	95 – 100	%	
Steel	95 – 100		
Galvanized Steel	95 - 100		
Compatibility			SAE Inc. Standard 100
Copper	Yes		
Steel	Yes		
Galvanized Steel	Yes		
Environmental Impact	Neutral		Ontario Regulation 558/00 (Leachate Testing) and NSF/ANSI 60
Carbon Consumption Rate	0.5	kg/amp-year	SAE Inc. Standard 111

Product Specifications

Formed by a combination of cementitious and carbonaceous particles, Conducrete[®] adheres well to native soils and will naturally absorb moisture to cure as a solid, impermeable surround. Conducrete[®] functions like a capacitor, absorbing electrical energy and dissipating it into the surrounding soil. Once cured, Conducrete[®] efficiently transfers energy electronically between conductor and earth, virtually eliminating corrosion and mechanically protecting the conductor from damage. Conducrete[®] will significantly extend the life of a grounding or cathodic protection system, ensuring the asset is protected for the intended design life.

Refer to Table 2 and Table 3 for Conducrete® product properties and testing results.

Table 2: Electrical Properties

Property	Typical Value	Unit	Test Method
Resistivity	2.8 – 5.0	Ω·cm	Modified ASTM G187-05
Conductivity	0.2 – 0.4	S/cm	Modified ASTM G187-05

Table 3: Material Properties

Property	Typical Value	Unit	Test Method
Physical State	Grey Powder		
Odor	None		
Setting Time	24	hours	
Cure Time	28	days	

Conducrete® is also environmentally neutral. It sets to form a solid that does not leach, dissolve or migrate into the soil or water. A table of toxicity characteristic leaching procedure (TCLP) results for Conducrete® material is included in Table 4 and Table 5 below.

Table 4: IEC 62561-7 Leachate Testing Results

Procedures in EN 12457-2 and EN 12506 standards were followed. Testing was performed by Powertech Labs Inc.

Ion	Concentration (mg/L)	Amount Released (%)
Aluminum	0.68	0.000068
Barium	1.74	0.000174
Zinc	0.06	0.000006

Table 5: Leachate (TCLP) Results

Leachate Data (TCLP Procedure) based on Regulation 558 performed by Testmark Laboratories Ltd.

Constituent	Conducrete® TCLP Concentration (mg/L)	USEPA Maximum Contaminant Level (mg/L)
Arsenic	< 0.01	0.010
Barium	0.383	2.000
Boron	0.158	2.000 [†]
Cadmium	< 0.001	0.005
Lead	< 0.01	0.015
Mercury	0.001	0.002
Selenium	< 0.01	0.050
Silver	< 0.01	0.100*
Uranium	< 0.01	0.030
Fluoride	< 0.01	2.000*
Nitrate (as Nitrogen)	< 0.01	10.000
Nitrite (as Nitrogen)	< 0.05	1.000
Cyanide	0.05	0.200

[†] No MCL established; value shown is USEPA's Lifetime Drinking Water Health Advisory.

* No MCL established; value shown is USEPA's secondary drinking water standard.

Note: < denotes less than method detection limit (MDL).

NSF/ANSI 60:

Conducrete® meets NSF/ANSI 60: Drinking Water Treatment Chemicals – Health Effects.

<http://info.nsf.org/Certified/PwsChemicals/Listings.asp?Company=C0169859&>

“SAE recognizes growing customer needs for better grounding options and continues to develop innovative products that better meet market demands.”

- **Todd Sirola,**
CEO, SAE Inc.

Installation and Application

Conducrete® is easy and economical to install in a variety of configurations. With an expected in-service time that is up to 20x the industry standard, electrode corrosion is virtually eliminated.

1. Dig trench 0.5 m (20") wide, 0.6 m (24") deep, and to designed length.
2. Smooth out the bottom of trench.
3. Lay copper wire in center of trench.
4. Cover wire to 4 cm (1.5") depth with Conducrete®
5. Hand shovel 13 cm (5") of loose backfill over Conducrete®
6. Backfill trench with excavated material.

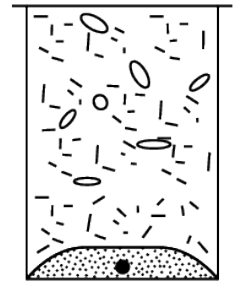


Figure 1: Horizontal Install

1. Drill hole to designed depth and diameter.
2. Place copper wire in center of hole.
3. Place Conducrete® in the hole in either a slurry or dry format.
4. Backfill top of hole with excavated material.

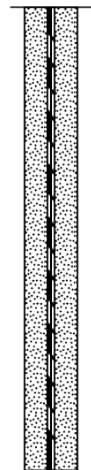


Figure 2: Vertical Install

Conclusion

Comprised of conductive cementitious and carbonaceous particles, Conducrete[®] dramatically reduces resistance to earth and impedance measurements due to its conductive nature. It absorbs high rise time electrical surges, keeping ground potential rise in check; preventing both infrastructure damage and ensuring public safety. Unlike traditional backfills, it won't wear away or require regular maintenance deployment—making quick work for both you and your team of installers.

SAE Inc.

Founded in 1990, SAE Inc. (SAE) is a leading manufacturer that specializes in electrical grounding and cathodic protection. SAE provides reliability for critical systems that cannot tolerate service interruption and has 28+ years of experience grounding structures and a proven track record of eliminating lightning-related outages. In addition to Conducrete[®], SAE also manufactures a variety of other conductive backfill products used for electrical grounding: ConduFlow[®] and ConduForm[™]. SAE also manufactures the ConduDisc[®] utility grounding plate and EnvirAnode[®] cathodic protection system. We also provide full-service electrical grounding design and engineering. For more information visit SAE's website at www.saeinc.com.

Glossary

Conducrete®: A conductive carbonaceous and cementitious material, normally used as a backfill for electrical grounding and cathodic protection applications to assist with the dissipation of surcharge.

Leachate: Acid that has percolated through a solid and leached out some of the constituents.



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