

# LPI EARTH ENHANCING COMPOUNDS

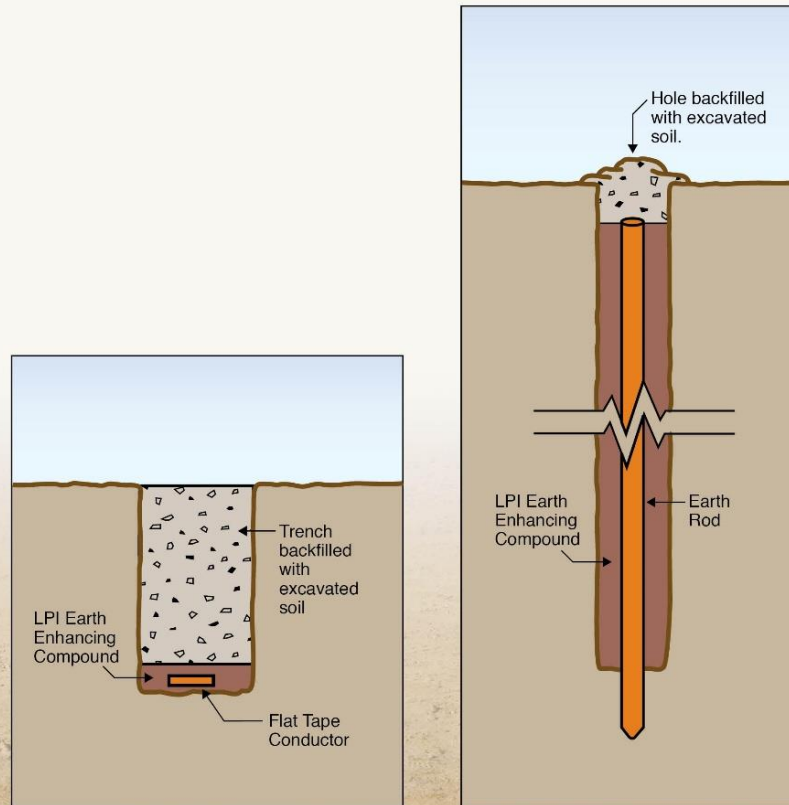
Due to varying soil conditions from one site to the next, the installation of earth electrodes alone can often fall short of achieving a low resistance earthing system.

The application of earth enhancing compounds (EECs) around earth electrodes makes a significant impact towards achieving the low resistance required for an effective earthing system. They achieve this goal without the expansion and shrinking characteristics of some cheap alternatives that can effectively render the earthing system useless over time.



Characteristic	RESLO	SRIM PLUS	Comment
Ingredients	Sodium bentonite, gypsum, special additive	Sodium bentonite, recycled aggregate, cement, carbon composite additives	RESLO – natural, benign components SRIM-PLUS – natural and recycled components
Packaging	LDPE-lined woven polypropylene bag	LDPE-lined woven polypropylene bag	Environmentally friendly, recyclable packaging
Shelf Life (years)	> 1	> 1	Shelf life is longer than 1 year if kept in a dry environment
Bag Size (kg)	20	20	User-friendly and efficient quantity
Resistivity ( $\Omega$ m)	~ 0.53	$\leq 0.1$	SRIM is at least 5 times more conductive than RESLO due to its special high-tech formulation
Typical Resistance Reduction	> 50%	> 65%	Temporal / seasonal variability is also greatly decreased
Typical Amount Required	5 x 0.3 m trench: 1 bag 0.125 x 1.8 m hole: 1 bag	5 x 0.3 m trench: 1 bag 0.125 x 1.8 m hole: 1 bag	Or use the LPI Earthing Calculator for more accurate estimates
Leaching	Negligible (but not for use around water tables)	Negligible, product sets like concrete (non-structural)	Leaching is well below EN and EPA limits or is undetectable
Sulphur Content	> 2% (from natural ingredients)	Negligible	All clays and gypsum have natural sulphur, which is generally benign
Corrosion Performance	Greatly exceeds IEC 62561-7 requirements	Exceeds IEC 62561-7 requirements	SRIM PLUS is specially formulated to be non-corrosive despite its high conductivity
Hardening	Semi-hardens within 3-5 days	Hardens / cures within 1-3 days	Hardening / curing time depends on environmental conditions
Maintenance Required	Nil	Nil	Permanent encasement of electrodes if installed per LPI instructions supplied
Service Life (years)	> 15	> 20	Long lasting enhancement if installed per LPI instructions
Standards Compliance	AS 2239, IEC 62561-7*, EPA 1311	IEC 62561-7, EPA 1311	* RESLO is only “non-compliant” with regard to sulphur content

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**STANDARDS COMPLIANCE: AS 2239**

**STANDARDS COMPLIANCE: IEC 62561-7**



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**EEC PITFALLS**

The following table highlights some of the pitfalls and mistakes that are made on occasions with the application of earth enhancing compounds (EEC).

<b>Pitfall / Mistake</b>	<b>Correct Approach</b>
EEC is applied dry, straight out of the bag.	The manufacturer's instructions should always be followed. There is not enough ambient moisture in the soil to replace the normal installation water quantity, especially for cementitious EECs, where the normal hardening process would not occur.
EEC is "diluted" (mixed with the excavated soil) before application.	An EEC reduces resistance by replacing the high-resistivity soil in the immediate vicinity of electrodes. It should never be mixed with the excavated soil.
Using EECs that are corrosive to earth electrodes.	Always request to see corrosion performance test results (for example, in compliance with IEC 62561-7).
Choosing an EEC purely on cost.	"Cheap" EECs may not comply with environmental standards (e.g., per TCLP leaching tests such as EPA 1311), may have poor resistivity or poor corrosion performance. If in doubt, ask for this information.

**EEC INGREDIENTS**

EECs come in many varieties and types, e.g., just bentonite, a bentonite-gypsum blend, an engineered product based on bentonite, carbon-based, and the latest high-tech variants using special ingredients.

Bentonite on its own is a low-cost material that has the ability to absorb huge amounts of water but has the tendency to crack under dry conditions. Despite its widespread use, particularly in the power sector, this characteristic may result in negative perceptions. The truth is that bentonite is present in most EECs, even carbon-based ones. Technically, the *amount* of bentonite in an EEC is a critical parameter. Up to a certain percentage, bentonite provides many positive benefits (such as excellent environmental credentials as a natural clay and it reduces permeability and hence corrosion attack on electrodes) without any of the disadvantages.

Both RESLO and SRIM PLUS use specially tailored amounts of bentonite in order to achieve optimum results. RESLO will harden without actually being a cementitious (containing cement) EEC, whilst SRIM PLUS is a carbon composite material with a special recycled aggregate and some cement, thereby going hard like concrete. Whilst bentonite and the recycled aggregate have some degree of electrical conductivity, SRIM PLUS achieves its market-leading conductivity through the addition of optimised amounts of a highly conductive carbon-based ingredient.