EH, Dielectric, SD, and Conductive: A Complete Guide to Electrical Footwear Ratings

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Work boots with electrical ratings can look nearly identical on the shelf — same construction, same brand, same price point. But choosing the wrong rating for a job site isn't a minor inconvenience. It's a safety failure.

EH, Dielectric, SD, and Conductive are four distinct designations that address different electrical hazards in completely different ways. Two of them protect against getting shocked. Two of them protect against causing a spark. And one of them — Conductive — actually provides zero protection against electrical shock on purpose.

This guide covers what each rating means, what standard governs it, which workers need it, and what employers need to know when specifying footwear for their crews.

The Standard Behind the Ratings: ASTM F2413

Most electrical footwear ratings in the U.S. are governed by ASTM F2413, the standard for performance requirements in protective footwear. When a boot meets a specific electrical requirement under F2413, that designation is stamped inside the boot: EH for Electrical Hazard, SD for Static Dissipative, or CD for Conductive.

Dielectric footwear is different. It falls under ASTM F1117, a separate standard written specifically for electrically insulating footwear used in high-voltage environments. Dielectric boots are not evaluated under F2413 and are not interchangeable with EH-rated boots.

When in doubt, look inside the boot. A compliant boot will show the ASTM designation and any ratings it carries.

EH — Electrical Hazard

EH is the most common electrical rating in work footwear. It's what most electricians, construction workers, and general tradespeople have in mind when they ask for a "safe boot for electrical work."

What it does: EH-rated boots provide secondary protection against accidental contact with an open electrical circuit. The soles and heels are made of non-conductive materials that resist electrical current under dry conditions. Under ASTM F2413 testing, the sole assembly must withstand 18,000 volts for one minute with no current flow exceeding 1 milliamp.

What it doesn't do: EH is a secondary protection — it's not designed for workers in direct contact with energized lines. It also provides no protection in wet conditions, since water compromises the insulating properties of the sole.

Who needs it: Electricians, HVAC technicians, construction workers, and anyone working near energized equipment where incidental contact is possible. This is the baseline electrical rating for most commercial and residential construction environments.

Employer note

EH is a secondary safeguard, not a substitute for lockout/tagout procedures or proper insulating PPE for direct electrical work. Specify EH in your footwear policy as a minimum standard for electrical trades, not as the sole control.

Dielectric — High-Voltage Electrical Insulation

Dielectric footwear is purpose-built for workers who may come into direct contact with energized electrical lines — primarily utility lineworkers and high-voltage electrical workers. These boots provide full electrical insulation through the entire boot, not just the sole.

What it does: Dielectric boots insulate the wearer against electrical current from the ground up. They contain no metal components — no steel toe, no shank, no eyelets — and are tested under ASTM F1117 at voltage levels far exceeding what EH-rated boots are designed to handle. Class 00 dielectric boots, for example, are rated for proof-test voltages of 5,000V AC.

What it doesn't do: Dielectric boots are not steel-toed and provide no impact or compression protection. They are specialty footwear for specific high-voltage tasks, not general-purpose work boots.

Who needs it: Utility lineworkers, high-voltage electricians, and workers in substations or on overhead power lines. These workers should be using dielectric overshoes or dielectric boots as part of a comprehensive electrical PPE system — not EH-rated boots.

EH vs. Dielectric — the key distinction

EH boots protect you if you accidentally step on or near a live circuit. Dielectric boots protect you when your job requires working directly on energized equipment. They address different risk levels and are governed by different standards. Do not substitute one for the other.

SD — Static Dissipative

Static Dissipative boots are designed for environments where the buildup and sudden discharge of static electricity is the hazard — not electrical shock from a power source. The goal is controlled bleed-off: slow enough to retain some insulating protection, fast enough to prevent a damaging static event.

What it does: SD-rated boots allow static electricity to dissipate in a controlled manner. Under ASTM F2413, the electrical resistance of an SD boot must fall between 100,000 ohms (0.1 megaohm) and 100 megaohms. This range is intentional — it allows charge to bleed off without letting the boot become fully conductive.

What it doesn't do: SD boots offer reduced electrical insulation compared to standard EH-rated boots. They should not be used as a substitute for EH-rated footwear in environments with open electrical circuits.

Who needs it: Workers in electronics manufacturing, pharmaceutical production, medical device assembly, and light industrial environments where sensitive components or processes could be damaged by static discharge. SD is often required on the floor of clean rooms or near static-sensitive assemblies.

Conductive (CD) — Rapid Static Elimination

Conductive boots take static dissipation to the extreme. Where SD boots offer a controlled, measured bleed-off, Conductive boots eliminate static charge almost immediately. This is required in environments where even a small static spark could ignite a flammable atmosphere or trigger an explosion.

What it does: Conductive (CD) boots have a maximum resistance of 500,000 ohms (0.5 megaohm) under ASTM F2413. This extremely low resistance ensures that any static buildup is instantly discharged to ground through the boot.

What it doesn't do: Conductive boots provide absolutely no protection against electrical shock. That is not a limitation — it is by design. The low resistance that makes them effective at eliminating static is exactly what makes them dangerous near live circuits. Workers wearing Conductive boots in areas with exposed wiring or energized equipment face a serious shock hazard.

Who needs it: Workers in explosive materials manufacturing, ammunition handling, mining environments with flammable gases, and other settings where a static spark could have catastrophic consequences. This is a specialty designation for a specific hazard profile.

Critical employer caution

Conductive boots and EH-rated boots are not interchangeable — they are opposites. Never issue Conductive boots to workers in environments with electrical hazards, and never issue EH boots where static spark hazards exist. If your worksite has both hazards, consult your safety officer about zoning and footwear protocols by work area.

Quick Reference

Use this table to compare ratings at a glance.

Rating	Standard	Protects Against	Best For	Key Caution
EH	ASTM F2413 EH	Open circuit shock (secondary)	Electricians, construction	Dry conditions only; not for direct contact
Dielectric	ASTM F1117	High-voltage electrical contact	Utility lineworkers	Inspect before every use; no metal
SD	ASTM F2413 SD	Static buildup (controlled bleed)	Electronics mfg., pharma, light industrial	Reduced EH protection

Rating	Standard	Protects Against	Best For	Key Caution
Conductive (CD)	ASTM F2413 CD	Static buildup (rapid bleed)	Explosives/flammable environments	Zero electrical hazard protection

How to Choose the Right Rating

The right rating starts with an honest assessment of the hazard on your job site — not just what's common or what a coworker wears.

- If you work near energized circuits or equipment, but not directly on them, EH is your baseline. It's the right choice for most electrical, construction, and industrial trades.
- If you work directly on energized lines at high voltage, you need dielectric footwear — not EH. Work with your employer and safety team to specify the correct voltage class under ASTM F1117.
- If you work around sensitive electronics or flammable materials where static is a concern, SD is typically the right call. It balances static control with some retained electrical insulation.
- If you work in explosive or highly flammable environments where a static spark is a life-safety risk, Conductive boots may be required. But confirm your electrical hazard controls before issuing them — conductive footwear removes a layer of electrical protection.

For employers building a footwear policy: match the designation to the hazard analysis for each role, not just the job title. An electrician doing rough-in work in a new building has a different risk profile than one servicing live panels in a manufacturing facility.

When in doubt, review OSHA 29 CFR 1910.136 (general industry) or 29 CFR 1926.95 (construction) and consult your safety officer or a qualified EHS professional.

Get the Right Boot for Your Job

Work 'n More carries work boots across all major electrical ratings from brands like Wolverine, Timberland PRO, Carhartt, and Red Wing. If you're not sure which rating applies to your work, our staff can help you read the label, match the hazard, and find the right fit.

Stop in at any of our locations or browse our full selection of safety footwear online at worknmore.com.