Slate roof

POLARIS CANTON ULTRA

Sourced from a premium, non-fading seam of rock, the Polaris Canton® Ultra is a uniform, very flat consistent Chinese slate that would suit modern or traditional builds.

Black/grey in colour and presents a beautiful chipped edge and shade variations, the Polaris Canton® Ultra offers one of, if not the best, value for money roofs available to the industry. W1-S1-T1 and complies with British standards.

600mm x 300mm

First-grade slate, meaning grading and wastage should be minimal





Roof Slate: What the Numbers Actually Show

When homeowners, architects, and builders compare roofing materials, cost and appearance usually top the list. But as embodied carbon becomes a bigger factor in construction decisions, natural slate is getting a fresh look — and the numbers are striking. Understanding the CO2 footprint of producing natural roof slate can help you make a genuinely sustainable choice, not just one that looks green on paper.

Why Natural Slate Starts With an Advantage

Unlike manufactured roofing materials, slate isn't built — it's quarried. It formed over millions of years through natural geological compression, which means production doesn't involve chemical binders, high-temperature kilns, or energy-intensive curing processes. The main carbon-generating steps are extraction, splitting, cutting to size, and transport.

That simplicity translates directly into lower emissions. Industry data puts the embodied carbon of natural slate at roughly **0.005 to 0.054 kg of CO2 per kilogram of material**, depending on the quarry, extraction method, and energy source used. Compare that to concrete roof tiles, at around 0.19 kg CO2/kg, and clay tiles, at approximately 0.43 kg CO2/kg — and slate's advantage becomes clear.

How Slate Compares to Other Roofing Materials

MATERIAL	APPROXIMATE EMBODIED CARBON (KG CO2/KG)
Natural slate	0.005 – 0.054
Concrete tiles	~0.19
Clay tiles	~0.43
Fibre cement	Higher still, due to energy-intensive mixing, compression, and autoclaving

Slate's low figure isn't an accident of marketing — it reflects the minimal processing the material requires. Concrete tiles depend on Portland cement, and cement production is one of the most carbon-intensive processes in the construction industry, releasing CO2 both from the energy used to produce it and as a direct chemical byproduct of the manufacturing process. Clay tiles require high-temperature firing, which adds significantly to their footprint. Slate simply needs to be extracted and split.

The Bigger Picture: Lifecycle Emissions

A single kilogram-for-kilogram comparison doesn't tell the whole story, because roofing materials don't all last the same length of time. This is where slate's advantage compounds.

- **Longevity:** High-quality natural slate can last well over 100 years, while concrete, clay, and fibre cement roofs typically need replacing every 30 to 40 years.
- **Fewer replacement cycles:** Because other materials wear out faster, their true lifetime carbon cost includes multiple rounds of manufacturing, transport, and installation — each adding to the total footprint.
- **Whole-roof savings:** Choosing natural slate over fibre cement on an average 100m² roof can avoid the creation of around 6.2 tonnes of CO2 over the life of the building — roughly equivalent to the emissions from driving a car 30,000 km (about 18,600 miles).

Even a lower-grade slate with a shorter 20-year lifespan compares favorably to alternatives when measured this way, though the environmental case strengthens considerably with high-quality, long-lasting slate.

End-of-Life: The Overlooked Factor

Embodied carbon calculations often stop at installation, but slate has another advantage most manufactured materials can't match: it's reusable. When a slate roof is eventually dismantled, the tiles themselves can often be salvaged and reused on new projects, rather than ending up as landfill waste. Concrete, clay, and fibre cement products typically can't be recovered and reused in the same way, meaning their end-of-life impact adds another layer to their overall footprint that slate largely avoids.

Key Takeaways

- Natural slate has one of the lowest embodied carbon values of any common roofing material, largely because it requires minimal processing compared to manufactured alternatives.
- Its exceptional lifespan — often exceeding a century — means fewer replacement cycles and lower cumulative emissions over a building's life.

- Sourcing matters: transport distance and shipping efficiency can meaningfully affect the total footprint, so quarry origin is worth checking.
- Reusability at end-of-life further reduces slate's long-term environmental impact compared to materials that can't be salvaged.

No building material has zero environmental impact — extraction, processing, and transport all carry some carbon cost. But when you weigh production emissions against decades of avoided replacements and end-of-life reusability, natural slate consistently comes out as one of the lowest-carbon roofing choices available. For anyone weighing sustainability alongside durability and design, it's a combination that's hard for manufactured alternatives to match.

Figures cited are drawn from published industry sources and lifecycle assessment data, including Environmental Product Declarations (EPDs) and industry carbon comparisons. Exact figures vary by quarry, extraction method, and product specification — always check the specific EPD for a given supplier when precise figures are needed for certification or reporting purposes.