# Continuous wear-liner telemetry on three mineral-processing scrubbers

A commercial deployment reference for wear-liner condition monitoring: what was installed, what it measures, and what has — and has not — been published about it.

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| Subject | Continuous wear-liner thickness telemetry |
| Deployment | 3 mineral-processing scrubbers, Fortescue Solomon Hub, Pilbara WA |
| Second contract | Gold processing plant, Kalgoorlie WA |
| Supplier | S5 System Pty Ltd (WearMon) · ABN 53 623 384 109 |

> **Evidence note.** This document publishes the commercial facts of the deployment and deliberately withholds the operating outcomes. No wear rate, residual-life figure, incident count, downtime saving or cost saving from these deployments has been released for publication. Section 7 sets out exactly what is verified and what is not.

Thejo Australia is a supplier of industrial rubber, polyurethane wear products and conveyor maintenance services. Fortescue Metals Group's Solomon Hub is an iron-ore operation in the Pilbara region of Western Australia. Both are named with reference to a commercial relationship; neither party has reviewed or endorsed this document, and neither is responsible for any statement in it beyond the facts of the deployment itself.

## Why this document exists

Assessment after assessment of this company has reached the same conclusion: the technology is plausible, the market is real, and there is no evidence that anyone has bought it. On that reading, everything else is a projection.

That conclusion was wrong, and the correction is simple. WearMon units have been purchased by a tier-two wear-products supplier and installed on production equipment at one of Australia's largest iron-ore hubs. A second commercial contract is running at a gold plant in the Eastern Goldfields. The gap was never the fuel; it was the ignition — the deployment existed and had never been written down in public.

This document closes that gap. It is deliberately narrow. It records the commercial relationship, the site, the operating environment and the measurement approach, and it is explicit about the one thing a buyer most needs to know: **which claims are verified and which are not.** A case study that inflates its numbers is worth less than no case study at all, because the first engineer who checks it stops believing everything else you wrote.

## The deployment

The units are installed on **three large-diameter rotating mineral-processing scrubbers** at Fortescue's **Solomon Hub** in the Pilbara. Scrubbers sit in the feed-preparation stage of a wet mineral-processing circuit: ore and water tumble inside a rotating drum, steel grinding media add impact, and the slurry is both abrasive and corrosive. The liner is the consumable that stands between that slurry and the structural steel shell.

The commercial path matters as much as the site. The buyer was **Thejo Australia**, not the mine directly. Thejo supplies the wear products — rubber, polyurethane and composite liner systems — and the maintenance services around them. A liner supplier that fits telemetry into its own consumable is a different kind of customer from a plant buying a monitoring system: it is buying a way to sell an instrumented liner and the service record that comes with it.

The second contract is with a **gold processing plant in Kalgoorlie, Western Australia**. It is recorded here as a commercial fact and nothing more; the equipment list, the measured results and the commercial terms are not published.

Both deployments are in Western Australia, both are hard-rock mineral processing, and neither is a laboratory or a demonstration site. That is the whole of the claim, and it is enough to answer the question the market was asking.

## The failure mode this addresses

A wear liner is consumed continuously. The thickness value that maintenance planners actually hold, however, is a point-in-time number taken with the vessel stopped and the shell open. Between those openings the liner keeps wearing at a rate that depends on ore hardness, throughput, slurry density and media charge — variables that do not hold still.

Three things follow, and all three are expensive:

**The interval is blind.** A site running a six-to-twelve-week shutdown cycle has no direct thickness reading for most of the period in which the liner is being consumed. Localised hotspots, plate detachment and a batch of unusually abrasive ore all act inside that blind interval.

**Wash-through is discovered late.** If a liner wears through, slurry scours the outer shell. By the time it is visible outside the vessel, the event has already become a structural repair and an unplanned stoppage rather than a liner change.

**Safety and cost pull in opposite directions.** The conservative response is to replace the liner before the measured wear says it is due. That is safe, and it discards consumable that still had service life in it. The aggressive response is to run to the calendar. That is cheaper, right up until the shell is in the slurry.

Every one of those three is a consequence of measurement frequency, not of measurement quality. The shutdown inspection is usually thorough. It is simply rare.

## The engineering approach

WearMon is a continuous thickness-measurement instrument for wear liners and wear plates. It is fitted into the liner zone during a reline — when the vessel is already open and the liner face is accessible — and it reports while the plant is running, over LoRaWAN or NB-IoT, so no cable has to survive a rotating shell.

What the record contains:

**Thickness in millimetres, at a fixed point.** The measuring point does not move between readings, so the difference between two values is real liner consumption rather than a difference between two inspection positions.

**Wear rate per tonne.** Consumption divided by tonnage processed gives a rate in millimetres per thousand tonnes, which is the figure that lets a planner compare one campaign against the next on a like-for-like basis.

**A run-out forecast.** Remaining thickness above the minimum safe discard thickness, divided by the measured rate, gives days remaining at current duty. If the ore changes, the rate changes, and the date moves with it.

**Missing data recorded as missing data.** A probe that stops reporting is an open maintenance job and the trend for that zone is frozen. It is never interpolated through the gap and never read as a pass. This is the least glamorous feature in the list and the one that decides whether the record can be trusted in a year's time.

The output is deliberately not a control action. WearMon produces a measurement and a forecast; the decision to reline, and the decision to keep running, stay with the site.

## Where this sits in an operator's assurance framework

It is common for a continuous measurement of a barrier's condition to be described as a safety device. That description is not accurate here, and using it would be the fastest way to lose an engineering audience.

**WearMon is not a safety instrumented function.** It has no safety integrity level, it is not declared as part of a safety instrumented system under IEC 61511, and nothing in this document should be read as a protective function that prevents shell wash-through. The control that keeps people and equipment safe remains the plant's own inspection and operating procedure.

What it does have is a documentary role, and IEC 61511 is a useful frame for explaining it. The standard's discipline is that a performance claim for a protective layer has to rest on measured proof-test evidence rather than on an assumption about how long a device stays healthy. Diagnostic coverage is the measure of how much of that failure space the evidence actually reaches, and a proof-test interval that is long relative to the failure mechanism leaves the claim resting on hope.

The mechanical wear barrier has exactly the same problem. A wall-thickness inspection at a shutdown is a proof test: it is real evidence, taken too rarely, at a point in time. Continuous thickness telemetry does not replace that inspection — it narrows the interval the inspection has to cover. A site that can show a thickness trend through the whole campaign, with the measured rate and the recorded gaps, is in a materially better position to justify its inspection interval than one that is extrapolating from a single reading.

That distinction is the honest version of this product's value: **diagnostic telemetry that supports a proof-test and inspection argument**, not a certified protective device. Buyers should hold us to that wording, and this document exists so they can.

## Why the liner supplier is the interesting part

The commercial model that produced this deployment is worth more attention than the site itself. A wear-liner manufacturer sells a consumable, and the buyer's natural instinct is to extend the life of that consumable. The supplier's natural instinct is to sell more of it. Instrumenting the liner changes the conversation for both sides.

For the supplier, an instrumented liner is a service product: a measured wear rate, a predicted reline window, and a record that can be shown to the plant's reliability engineer. The consumable stops being a commodity priced per kilogram and becomes a managed asset with a warranty argument attached to it.

For the plant, the source of the measurement is the party that also carries responsibility for the fit. That removes the classic failure mode of condition-monitoring projects — a sensor fitted by one contractor, a liner fitted by another, and a reading nobody owns.

For S5, it means the route to market is not 155 mine sites. It is a small number of liner and wear-products suppliers who each already sit inside dozens of plants. That is a distribution argument, not a technology argument, and this deployment is the evidence that it can work.

## Evidence status: what is verified, what is withheld

This section is the point of the document. Read it before quoting anything else.

**Verified** (owner-confirmed, October 2026): the commercial sale, the site, the equipment count and the second contract, as listed in the evidence table below.

**Withheld.** S5 has not published a measured outcome from either deployment. There is no published residual-thickness figure, wear rate, reline-date accuracy, incident count, downtime reduction, inspection-frequency reduction or cost saving. If you have seen a number attributed to this deployment anywhere else, it is not from us and it is not verified here.

**Industry context is not a result.** Published industry figures for liner replacement practice and shell damage exist and are useful for framing the problem. They are estimates about the industry, not measurements of this site, and this document does not put them forward as either.

The reason is not modesty. A condition-monitoring deployment produces a large volume of commercially sensitive operating data, and the site's consent to publish is a separate permission from its consent to install. Until that permission exists, the honest position is the one above: the relationship and the installation are facts; the outcomes are the site's data.

| CLAIM | STATUS | BASIS |
|---|---|---|
| WearMon sold to Thejo Australia | Verified | Owner-confirmed, 2026-10-10 |
| Installed on 3 mineral-processing scrubbers | Verified | Owner-confirmed, 2026-10-10 |
| Site: Fortescue Metals Group, Solomon Hub, Pilbara WA | Verified | Owner-confirmed, 2026-10-10 |
| Second commercial contract: gold plant, Kalgoorlie WA | Verified | Owner-confirmed, 2026-10-10 |
| Measured thickness trend / wear rate (mm/kt) | Not published | Site data; no publication consent |
| Residual life / reline-date accuracy | Not published | Site data; no publication consent |
| Incident count, downtime or cost saving | Not published | No S5 measurement released |
| Inspection-frequency or liner-life improvement | Not published | No S5 measurement released |
| Kalgoorlie asset description | Not published | Commercial-in-confidence |

## How a buyer can verify this

The deployment is not a marketing abstraction, and it should not be taken on trust. Three routes exist:

**Ask for a reference call.** S5 will arrange a technical conversation with the supplier side of the deployment, subject to that party's agreement, scoped to engineering questions rather than commercial terms.

**Ask what is not published, and why.** The answer is in the evidence table. A supplier who can name the limits of their own evidence is a supplier worth a second meeting.

**Test the method on your own duty.** A trial on one zone produces your wear rate on your ore, which is the only number that will ever matter to your planner. That is also the least expensive way to find out whether the instrument survives your environment.

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