

World leaders in semiconductor innovation

Creating ultra-thin, ultra-low-cost flexible integrated circuits

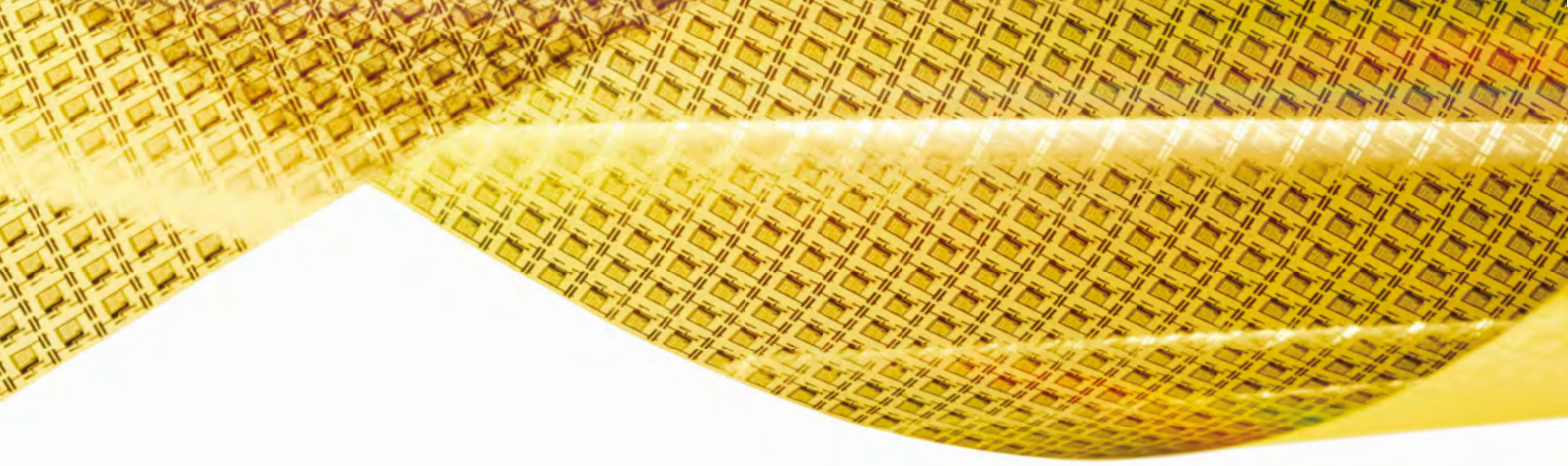
Pragmatic Semiconductor has developed an integrated circuit (electronic 'chip') platform that doesn't rely on silicon. Our revolutionary technology uses thin-film semiconductors to create flexible integrated circuits that are thinner than a human hair, and are significantly cheaper and faster to produce than silicon chips. This provides a compelling alternative for many mainstream electronics applications, as well as enabling new applications not possible with silicon.

Pragmatic's ultra-low-cost, ultra-thin, flexible integrated circuits make it possible to embed our chips into almost anything, bringing connectivity and intelligence to everyday objects. Example applications include **radio frequency identification (RFID)** and **near field communications (NFC)**, where our chips cost around a penny and allow these everyday objects to be given unique digital identities as well as interact with their environment. This brings game-changing benefits to the entire product

lifecycle, including inventory reduction, traceability, counterfeit detection, proof of provenance, and customer interaction. Pragmatic's technology is a key enabler for a circular economy and supporting sustainability goals, preserving valuable resources by allowing organisations to effectively reduce, recycle and reuse products and materials. Examples include:

- **Reducing food waste.** By adding our chips to food packaging, retailers can use RFID and sensors to determine freshness, better controlling supply chains and enabling dynamic use-by dates.
- **Recycling materials.** Our technology can be used to significantly improve the return and recycling of single-use packaging, for example through Deposit Return Schemes (DRS), which can now be deployed with automated identification to increase availability, convenience and return rates.
- **Reusing packaging.** Our chips enable item-level traceability of multi-use assets within a universal system for recapture, sorting, cleaning, and return.





Underpinning these mass-market use cases, Pragmatic is the world's most **sustainable** semiconductor manufacturer. Our technology uses 100x less energy and water, and has up to 1000x lower carbon footprint than conventional silicon manufacturing.

Pragmatic also offers **rapid customisation** of functionality. We can deliver made-to-order chips from design to production in just a few days rather than several months. We enable designers to create their own application-specific flexible integrated circuits at a fraction of the cost and time required to develop custom silicon chips. Our foundry service uniquely allows **agile hardware design**, exponentially accelerating solution development and time-to-market. Examples include proprietary RFID protocols, time/temperature indicators, fingerprint sensors, wearable smart patches for healthcare, flexible display drivers, and novel microprocessor architectures.

We also offer a **Fab-as-a-Service** model that enables secure, dependable, localised semiconductor supply through manufacturing directly on a customer's site. This highly scalable distributed production allows cost-effective, high volume fabrication of flexible integrated circuits. Compared to conventional silicon fabs costing billions of dollars, our fabs require around 100x lower capital expense and typically have >100x smaller physical and environmental footprint. Our self-contained modular fabs can be located anywhere in the world, delivering onsite 'just in-time' chip production that meets changing local demand whilst minimising inventory costs and ensuring continuity and security of supply at a local and national level.

Pragmatic is headquartered in Cambridge, UK, with our first fab operating in Sedgefield, and a second fab recently commissioned at our new 15-acre Pragmatic Park site in Durham. Pragmatic has secured over \$400 million in funding from venture capital, sovereign and strategic investors including M&G's Catalyst, UK Infrastructure Bank, Cambridge Innovation Capital, Arm (global leader in semiconductor design IP), Avery Dennison (global leader in RFID), and Amcor (global leader in consumer and healthcare packaging).

