



## PRAGMATIC'S FLEXIBLE INTEGRATED CIRCUITS MPW PROTOTYPING

Picture Source: Pragmatic

**EUROPRACTICE Multi-Project Wafer (MPW) services now offer flexible integrated circuit (FlexIC) fabrication from Pragmatic Semiconductor, headquartered in Cambridge, UK.**

### Why EUROPRACTICE?

- ▶ Affordable and easy access to Prototyping and Small Volume Production services for academia and industry.
- ▶ MPW (Multi-Project-Wafer) runs for various technologies, including ASICs, Photonics, MEMS and more.
- ▶ Advanced packaging, system integration solutions and test services.

### Why Pragmatic?

- ▶ FlexIC Foundry offers flexible integrated circuit technology at a fraction of the cost of silicon.
- ▶ Rapid cycle time takes designs from tape-out to delivery in around six weeks.
- ▶ Flexible form factor enables novel use cases.
- ▶ Low non-recurring engineering (NRE) cost for volume production.

### Technology Highlights

Pragmatic is revolutionising semiconductor fabrication with low-cost flexible integrated circuit (FlexIC) technology that makes it quick and easy to embed intelligence almost anywhere.

Using thin-film transistor (TFT) technology in combination with conventional semiconductor processing equipment, our FlexIC Foundry® service takes FlexICs from tape-out to delivery in around six weeks, enabling agile iterations, early end-user testing, and an accelerated time to market – at a fraction of the cost of silicon.

Particularly suited to applications where form factor and cost outweigh speed and performance criteria, FlexICs excel in areas such as radio frequency identification (RFID), multiplexing, driver and readout circuitry, and basic computation.

### Helvellyn 2.1.0

This second-generation technology node offers four metal layers over a 600nm minimum channel dimension n-type FET process. The process also includes a dedicated resistor layer and capacitors. With an operating voltage of 3 VDC, total thickness of 30µm, and minimum bending radius of 5mm, Helvellyn technology is ideal for applications such as IoT, wearables, AR/VR and sensing.

### Key features

- ▶ Flexible ICs with ~30µm thickness
- ▶ Process Design Kit (PDK) compatible with industry-standard EDA tools
- ▶ Device library including transistors, resistors and capacitors
- ▶ Four-metal layer stack for efficient interconnects

## Pragmatic's FlexIC

Transistors	Metal oxide thin-film transistor	n-type FET
	Minimum channel dimension	L= 600 nm
Resistors	Dedicated resistor layer	200 k $\Omega$ /sq.
Interconnects	Independent metal routing	4 layers (2 dedicated)
Physical	Total thickness	~30 $\mu$ m
	Minimum bend radius	5 mm
	Redistribution layer	Aluminium
Turnaround	Tape-out to delivery	approx. 6 weeks
Deliverable	Dies in gel-box	50

## EUROPRACTICE Webinar Series



Do not miss an upcoming EURO PRACTICE webinar series on the Pragmatic FlexIC technology. This webinar series consists of two webinars, where the first episode will give a general introduction to Pragmatic's flexible integrated circuits and their potential applications. The second webinar will dive into more technical details about the PDK and the access procedure to MPW runs through EURO PRACTICE.



### Introduction to Pragmatic's flexible integrated circuits

19 September, 11:00 CEST

Dr Francesca Bottacchi, Pragmatic



### Pragmatic's FlexIC platform: Technical aspects and MPW Services

26 September, 11:00 CEST

Suman Balaji, Pragmatic  
Adil Masood, imec

