

# Conductive Biosensor Ink



Creating Material Change



*Innovation underpins everything we do*  
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# Biosensors

Across the globe, there has been a significant rise in chronic diseases such as diabetes. Together with an increased demand for home care devices, the requirement for biosensors has accelerated.

Traditionally, biosensors used in applications such as blood glucose and uric acid testing use metallics and carbon materials.

Haydale's biomedical inks reduce the use of metallics and meet the growing need for low cost, high volume, lightweight, flexible, and non-intrusive healthcare.

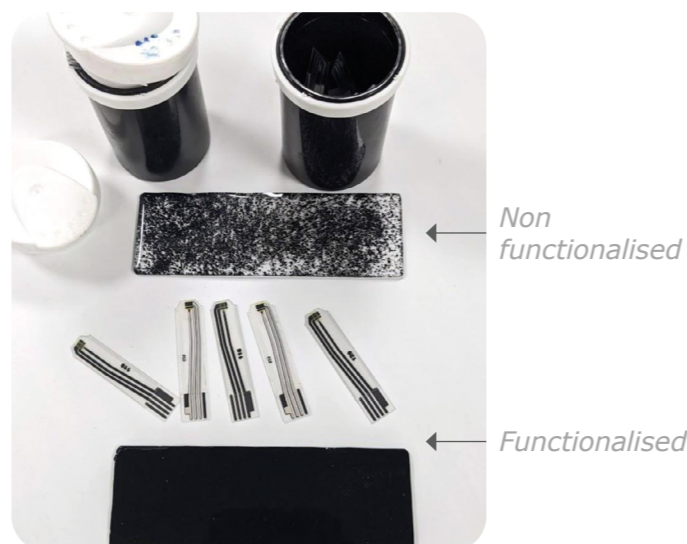
The inks use advanced materials such as graphene and additional chemistries to enhance the electrical conductivity and enzyme immobilisation. Haydale's approach also significantly reduces the environmental impact of producing and disposing of medical devices.

## Creation

Haydale is creating the next generation of advanced materials for innovative healthcare solutions.

Our biomedical inks are manufactured using Haydale's patented HDPlas functionalisation process. Our unique functional inks offer enhanced features:

- Improved consistency
- Improved conductivity
- Better product stability
- Improved electrochemical performance
- Cost effective



## Benefits

- Enhanced electrical conductivity through the HDPlas process, which promotes faster charge transport and higher sensitivity
- Functionalised conductive carbon-based inks with a significantly lower surface resistance  $<8 \Omega/\text{sq}$  normalised to  $25.4 \mu\text{m}$
- Surface functionalisation removes moisture, surface oxygen and polar groups to give a less hydrophilic product
- Customisable for applications including glucose sensing, uric acid testing and kidney disease detection
- Tuneable viscosity for improved printability in volume production
- High chemical stability and tuneable hydrophilicity
- Flexible conductive inks used for flexible coating and printing systems
- Increased flexibility with the ability to withstand 180 degrees without cracking
- High speed printing abilities such as flexographic
- Low C/V ratios during extensive production quantity in-line tests

# Applications

## Glucose Management

Haydale's conductive ink materials enable the production of glucose test strips that facilitate self-monitoring of blood glucose (SMBG) levels. These conductive materials are the primary component for glucose sensing functionality, which directly impacts the patient's well-being.

## Uric Acid

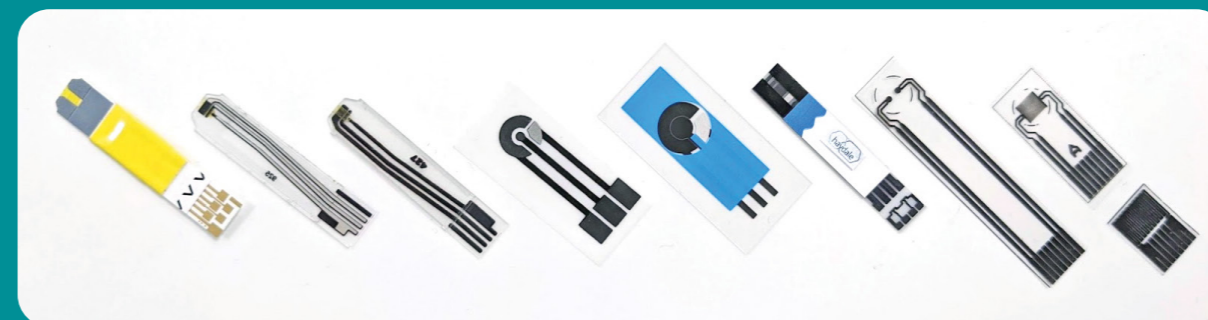
Haydale has a range of inks for the use in uric acid testing. Working in a similar way to our blood glucose sensors, these inks work to detect subtle electrochemical differences in uric acid and can be used for example for the detection of gout.

Haydale's ink has demonstrated high sensitivity to uric acid at low concentrations, which allows detection at much lower levels. These inks are environmentally friendly and have all the added benefits mentioned previously.

## Biomarkers

Haydale's biosensor inks have been optimised and developed for the measurement of kidney disease. Haydale's biosensor strips can provide good levels of detection and are comparable to conventional glassy carbon sensors. Our disease biomarker inks can detect levels of micro-RNAs in blood to diagnose kidney disease.

*These are just some application examples. At Haydale we work on customising our ink technology to our customers' requirements using a range of off the shelf materials or bespoke solutions.*



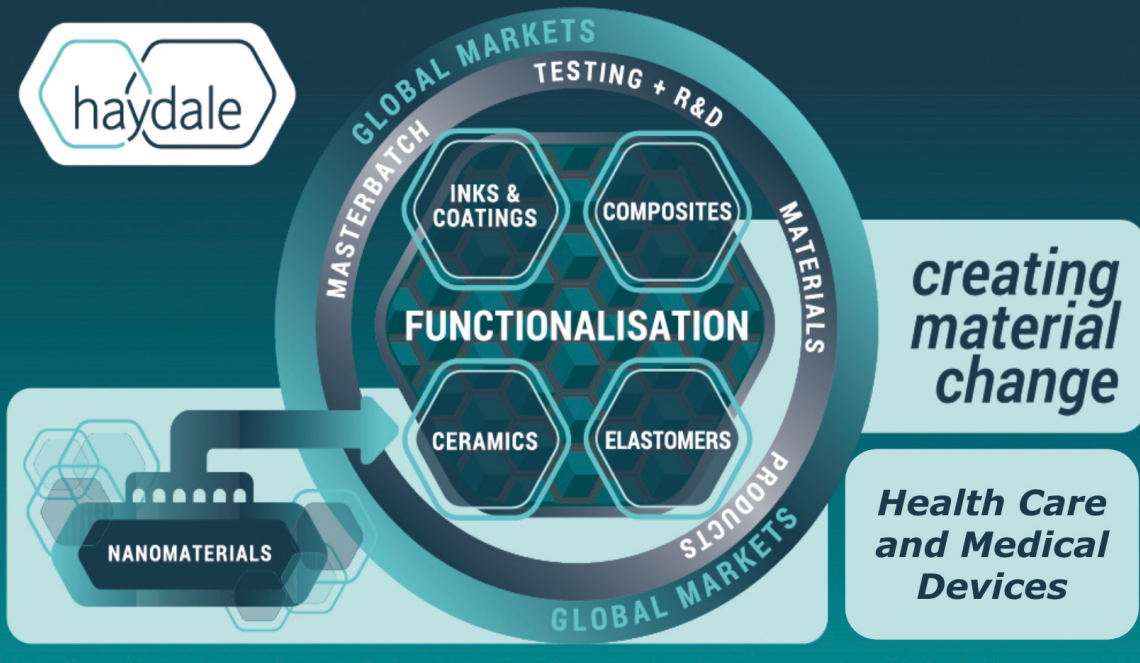
Traditional Sensors

Graphene Enhanced Sensors

## Sensing Material Change

Haydale has a range of customisable inks for a wide range of applications in the sensors market. Contact us for bespoke solutions to meet your specific requirements. Haydale is here to help with end to end support from sourcing the correct material for your specific application to creating a commercialised product.





## About Haydale

For the medical electronic device industry, Haydale offers reliable, proven solutions using functionalised conductive inks. From sensors measuring blood glucose and uric acid to ECG electrodes and non-invasive devices, Haydale has developed a suite of biosensor inks for screen printed carbon electrodes (SPCE).

Printing using conductive inks has wide reaching commercial opportunities in electronics, sensors, and medical systems. Haydale offers an extensive range of cost-effective nano-enhanced ink products. Our biomedical inks offer ease of manufacture, quality, product stability, and consistency compared to the widely used graphite and other carbon materials available.

Produced in the UK, our biomedical inks are manufactured using an environmentally friendly, sustainable plasma process that functionalises an array of graphene-enhanced materials. Using Haydale's functionalisation process allows for large performance gains in the conductivity of carbon inks.

Haydale is ISO 9001 and ISO 14001 accredited. Our functionalised materials are produced to stringent quality control procedures, managed by an experienced team offering a dedicated end to end support service from consultancy through to materials development and application.

Contact Haydale today to see how our expertise in biomedical applications can help find a solution for you.



### Contact us

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