
Doing what I couldn't
do yesterday
with Pinweld


Repairing what I couldn't
repair yesterday


Making what I couldn't
make yesterday

A little history

Pinweld is an innovative technology start up working in the field of plastic welding. Supported by an Innovate UK SMART grant we developed our patented novel welding equipment together with our partners & some invaluable guidance.

ADVANCED ENGINEERING PREVIEW **PINWELD**

A Revolutionary Solution

WELDING TECHNOLOGY SET TO REVOLUTIONISE HOW PLASTIC COMPONENTS ARE DESIGNED, MANUFACTURED AND REPAIRED.

The term "revolutionary" may appear hyperbolic but it can be genuinely attributed to the advances Pinweld is making in precision welding technology. Capable of accurately joining plastic and composite components, Pinweld is fundamentally changing how plastic components are designed, manufactured and repaired.

"Designers, repairers, analysts and engineers alike have commented on the benefits that our technologies could, and now will, bring to their work. An ability to reduce costs, component count, reuse, customise, modularise, seal, and join in ways they couldn't do yesterday," says Keven Chappell, Director.

Pinweld's technology is currently in the latter stages of development, but is already able to produce discreet linear welds in a growing range of thermoplastics. When used with its own AI or machine learning capabilities this has been designed to offer the user a portable, low-power, safe and intelligent plastic welding system with full metrics.

62 MANUFACTURING AND ENGINEERING MAGAZINE

So what is Pinweld?

The ability to accurately & reliably join semi-crystalline thermoplastic mouldings without using fillers, fixings, adhesives or even much energy...

...for the first time

You know, the stuff they make wheelie bins from. *Plus* bumpers, boats, masks, furniture, pipes, ducting, signs, planters, panels, boxes & much, much more


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Some comments as we engaged with people & press on the project :

”a sewing machine for plastics”

”the opposite of a jigsaw”

Problem

Market gap

Few, if any, products on the market help repairers create a fast, reliable & sturdy repair for sheet PP based plastic products

Target audience

Automotive bodywork repairer market valued at £20m in 2018

Costs

Escalating costs, commercial & societal pressure to change

External forces

Increasing use of sensory electronics & variable recycled material content look set to outpace repair attempts

Solution

Close the gap

A right-first-time repair gives repairers & customers options. No other technology on the market offers the same features

Target audience

Insurer led & independent automotive bodywork repairers

Savings

A return on investment measured in weeks. Reduction in replacement parts, packaging, transport & recycling

Intuitive in use

Simple design giving repairers the safe, low energy, market specific solution they need

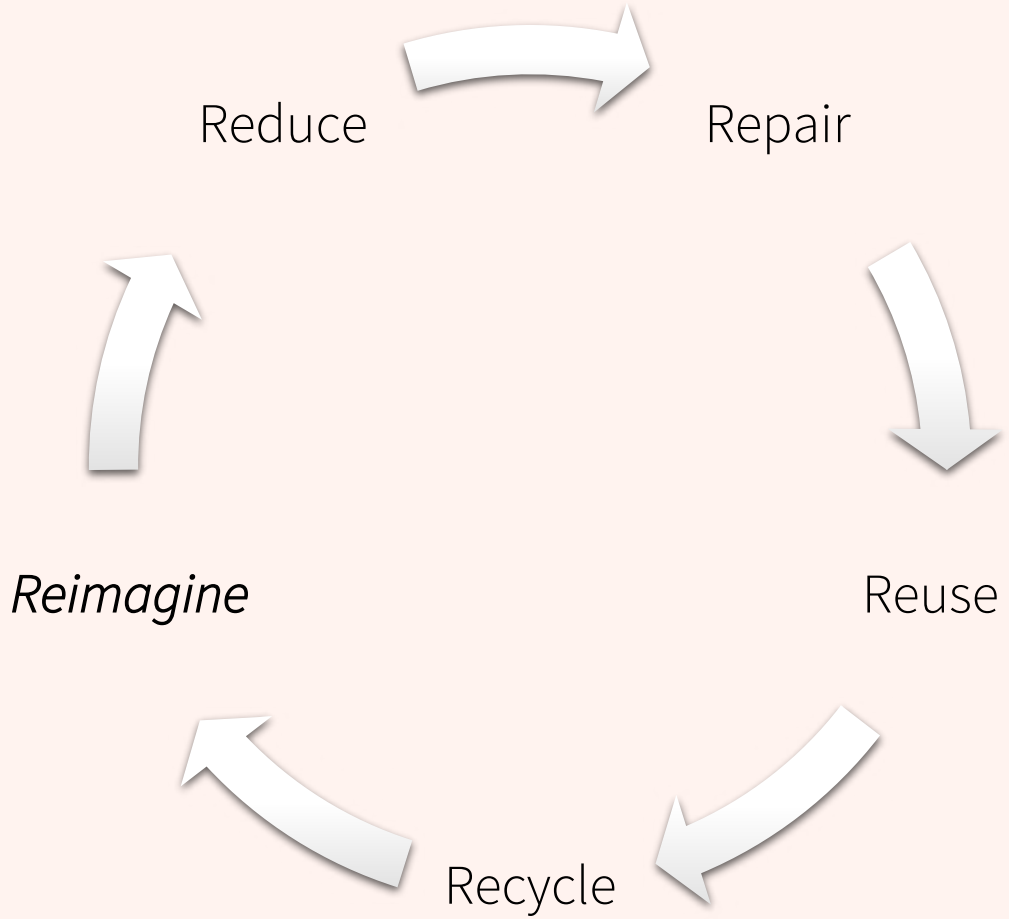
New possibilities

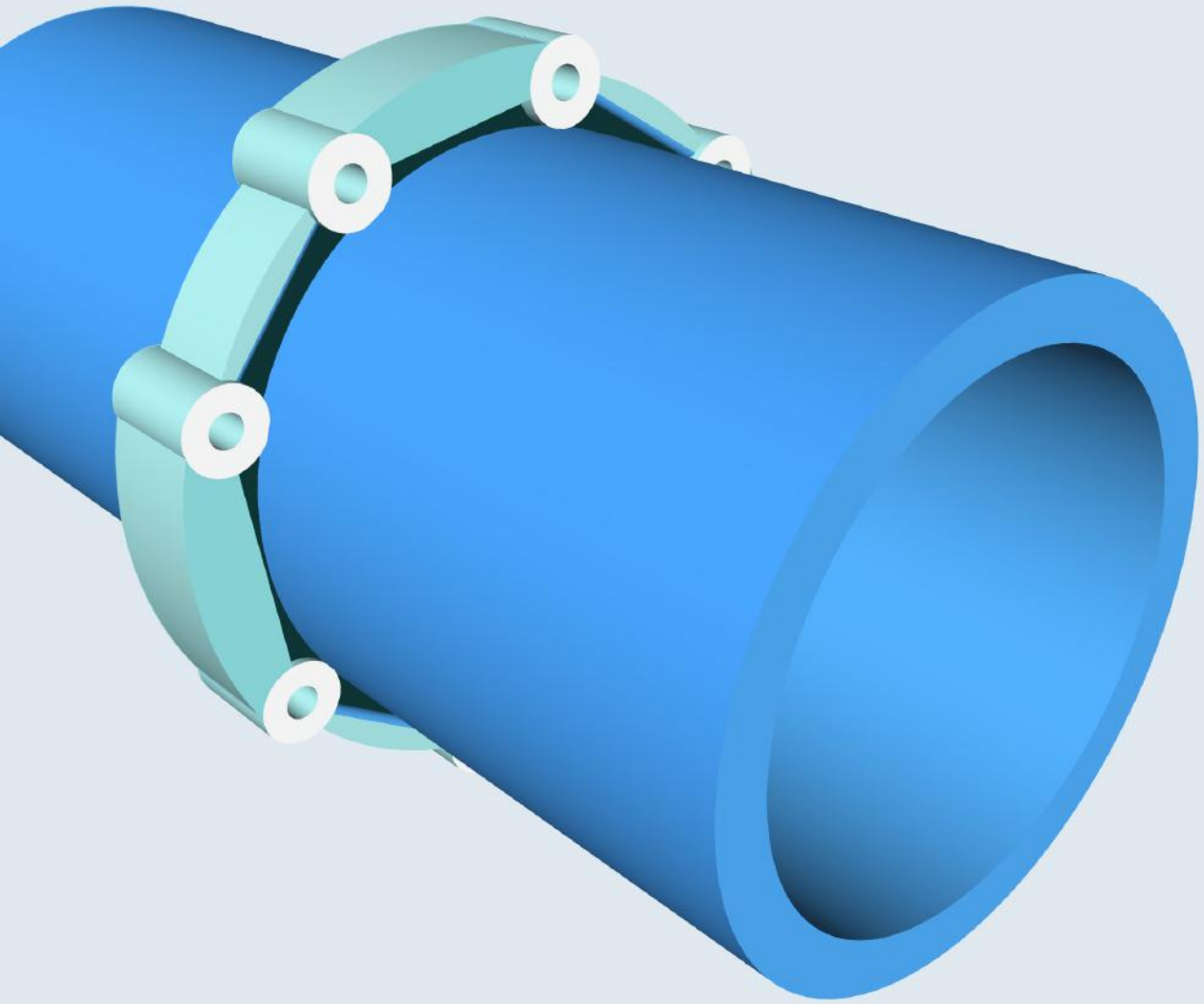
Reimagine

If the joint isn't required for maintainability & is really just a legacy feature of previous design limitations, why not weld it?

Benefits

- No seals, sealants, fastenings or clamps - no leaks
- Less material (no shoulder) promotes lightweighting
- Modular construction & Mass Customisation opportunities
- Enhanced repair options extends usable service life
- Homogenous assemblies promote EOL recycling
- Single pass customer-ready weld path
- An automated low-energy process





Current research

Water pipe jointing

The goal of leak-free installation of new water distribution networks to address currently unsustainable leakage levels

Target audience

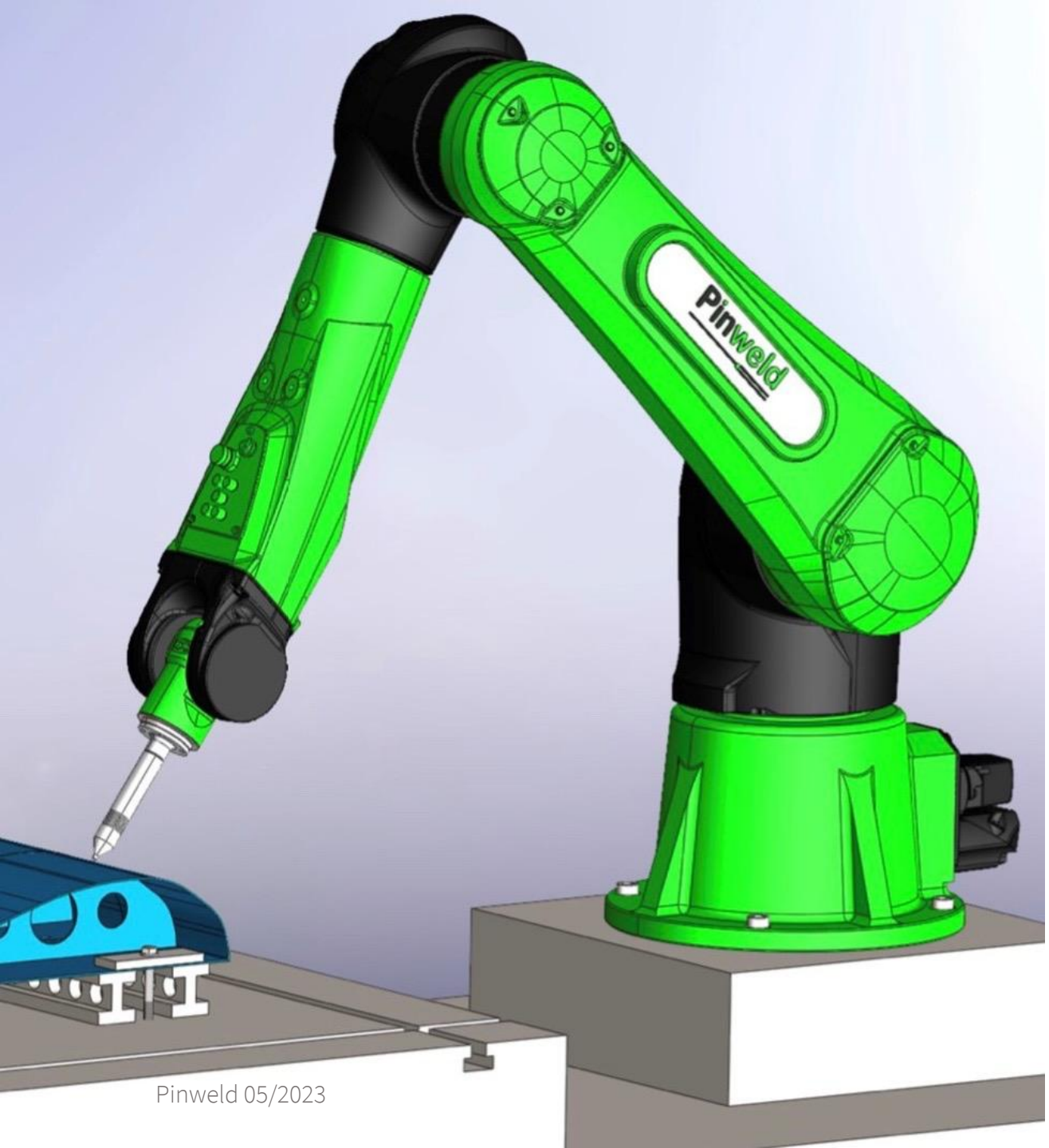
UK Water distribution companies & export opportunities

Support

2nd Innovate UK grant to develop the AI controls with TWI, ATS Global, Lancaster University & notable other partners

Benefits

Improved pipe joint quality by removing equipment errors & contamination at source during installation



Current research

Automated manufacture

To compliment modular manufacture & FDM (3D Printing) techniques for fast, short-run / high-value applications

Target audience

Automated manufacturing specialists & integrators

Support

University partners & industrial robot manufacturers

Benefits

Reduced financial barriers to entry compared with large format moulding combined with particularly low energy use & high accuracy, discreet & repeatable welds

Current research

Water pipe repair (internal)

The goal of creating an automated repair payload to address currently unsustainable background leakage levels from within

Target audience

UK Water distribution companies & export opportunities

Support

TBA (07/ 2023)

Benefits

Improved water provision & an enhanced ability to quickly target identified background leakage through *No Dig* methods reducing the costs both financial & environmental

Design opportunities

Unique

The only technology specifically dedicated to the goal of welding ANY thermoplastic (including reclaimed & bio based)

Tested

Low deformation, high performance welding already exceeding strength requirements for certain industries

First to market

Linear welding of sheet form hard plastics including PE & PP, materials that have stubbornly resisted solution.

Research

Ongoing Innovate UK supported development with materials experts at TWI & our university partners

Summary

At Pinweld, we believe that our welding solution will inspire new products, new opportunities & new routes to circularity. By offering our next-generation technology, we want to help others achieve great things while using fewer resources.

We thrive because we engage with knowledgeable partners to form great teams, as long as you the designer want to “Make what you couldn’t make yesterday"

Thank you

Keven Chappell

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https://www.pinweld.com