

INNOVATION THROUGH KNOWLEDGE TRANSFER

THE *PERFECT* SME BUSINESS MODEL

NEIL MALONE - CHAIRMAN
HEAT TRACE LTD.

INNOVATION THROUGH KNOWLEDGE TRANSFER

IDEAL COMPANY PROFILE

LONG PIPELINE HEATING

- **SME** - less than 250 employees
- **INNOVATION** - ideas/concepts

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INNOVATION

LONG PIPELINE HEATING

- R & D SPEND
- I.P. SPEND

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BENEFITS / INCENTIVES

- R & D TAX CREDITS
- PATENT BOX
- GRANTS

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HEAT TRACE LTD PROFILE

- 40 YEARS
- SME THROUGHOUT
- INNOVATIVE (Q.A. 2014)
- 13% REVENUE SPEND ON R & D
- £100K+/YEAR SPEND ON I.P.

So - what do we do?

- **Historically – industrial pipe & tank trace heating**



- **Freeze protection** – water pipes in industry, commercial & residential
- **Temperature maintenance** – oil pipes, tanks, industrial chemicals, foodstuffs

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R & D TAX CREDITS

- R & D SPEND ENHANCED
- STARTED AT 150%
- CURRENTLY 225% i.e. for each £1 spent on R & D, £2.25 can be deducted from profits for tax calculations

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EFFECT OF R & D TAX CREDITS

Sales	£10.0M
Cost of Sales	<u>£4.0M</u>
Gross Margin	£6.0M
Overheads	<u>£4.5M</u> (incl. £1.0M R & D spend)
Pre-tax Profit	£1.5M
Tax @ 22%	= £330k

Tax credits enhance R & D spend to £2.25M. Tax liability reduces by £1.25M x 22% i.e. by £275k to only £55k

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EFFECT OF PATENT BOX

- TAX RATE ON ALL SALES OF EURO PATENTED PRODUCTS IS 10%, COMPARED WITH TYPICALLY 28% FOR UNPROTECTED SALES
- OVERALL EFFECT OF PATENT BOX + R & D TAX CREDITS WILL USUALLY RESULT IN ZERO TAX LIABILITY

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EFFECT OF GRANTS

- LONGP
- 2010 £299,159
 - 2011 £311,301
 - 2012 £186,829
 - 2013 £181,150

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COLLABORATION WITH UNIVERSITIES

LONG PIPELINE HEATING

- SME's – limited resources
- Universities – people/facilities
- Natural /automatic connection

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HEAT TRACE'S COLLABORATION WITH UNIVERSITIES

LONG PIPELINE HEATING

- UNIVERSITY OF MANCHESTER
- MMU
- BIRMINGHAM
- SALFORD
- CRANFIELD
- KAISERSLAUTEN

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HEAT TRACE'S COLLABORATION WITH UNIVERSITIES

LONG PIPELINE HEATING

- KTP PROJECTS
- COLLABORATIVE PROJECTS
- AD-HOC BUSINESS

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HEAT TRACE'S COLLABORATION WITH UNIVERSITIES

LONG PIPELINE HEATING

KTP PROJECTS

- MMU – 3 x Polymer projects
- Univ. of M/cr – Nuclear project

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KTP COLLABORATION WITH UNIVERSITY OF MANCHESTER

LONG PIPELINE HEATING

Nuclear project

- 3 Years to Sept. 2016
- Objective to influence nuclear standards
- To increase sales into this sector
- To gain a long term employee

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JOINT COLLABORATION PROJECT WITH UNIVERSITY OF MANCHESTER

LONG PIPELINE HEATING

HeatAI Project – concluded Sept 2012

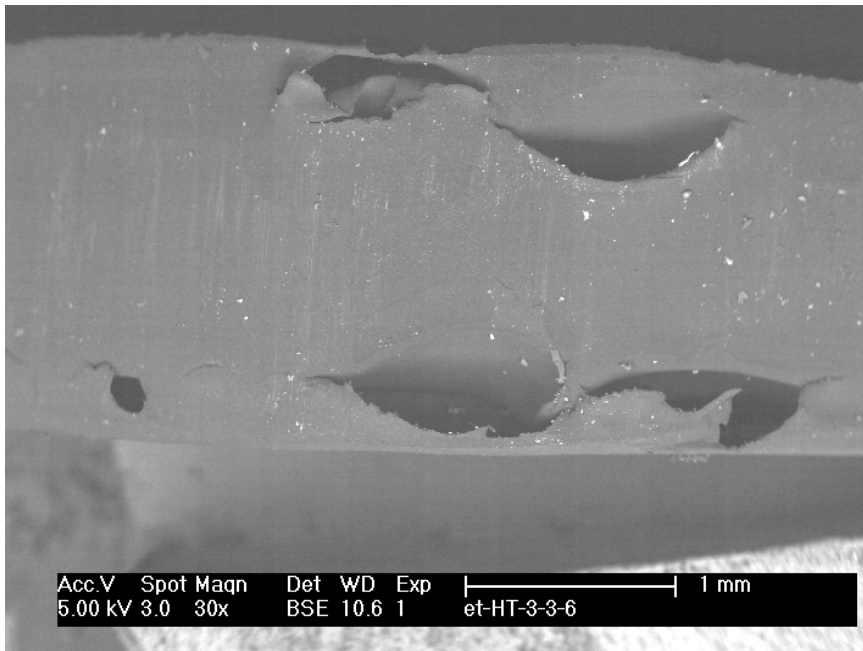
- 3 Year project, grant total value £1M
- Objective to substitute copper with aluminium in heaters
- To reduce heater costs by up to 70%
- To develop multiple new products
- To develop multiple new markets

Polymer examination

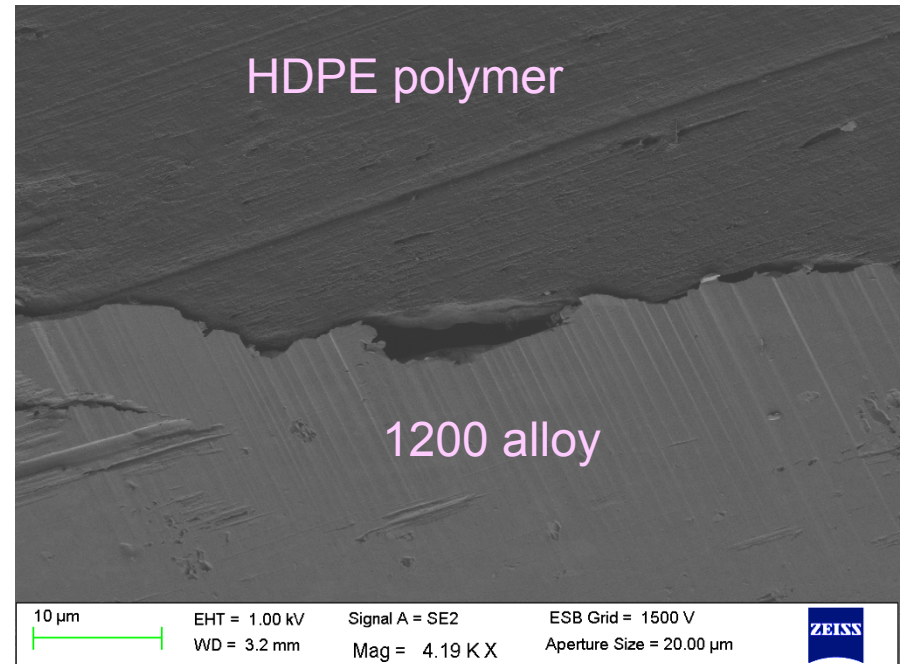


etHT331:

etched/desmutted aluminium with HDPE polymer. The resistance at 50 Hz is 349 Hz



HDPE polymer cross section

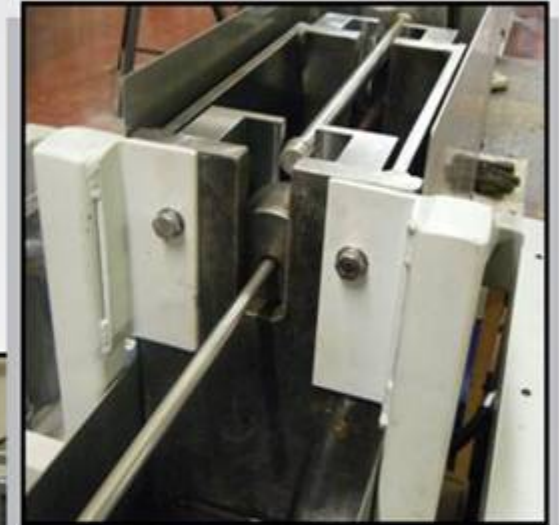
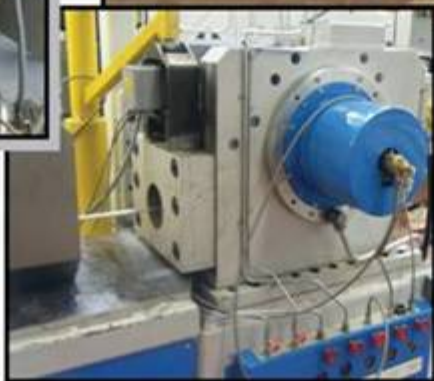


HDPE relatively good adhesion compared to the following with higher impedance

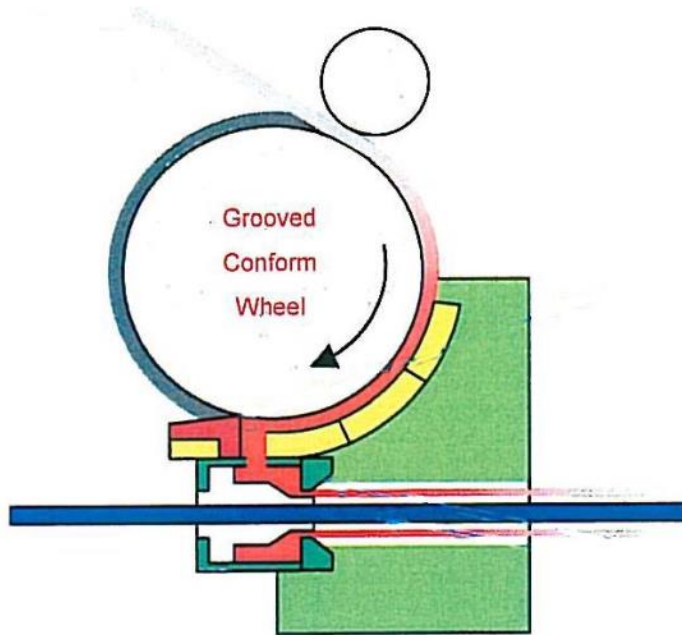
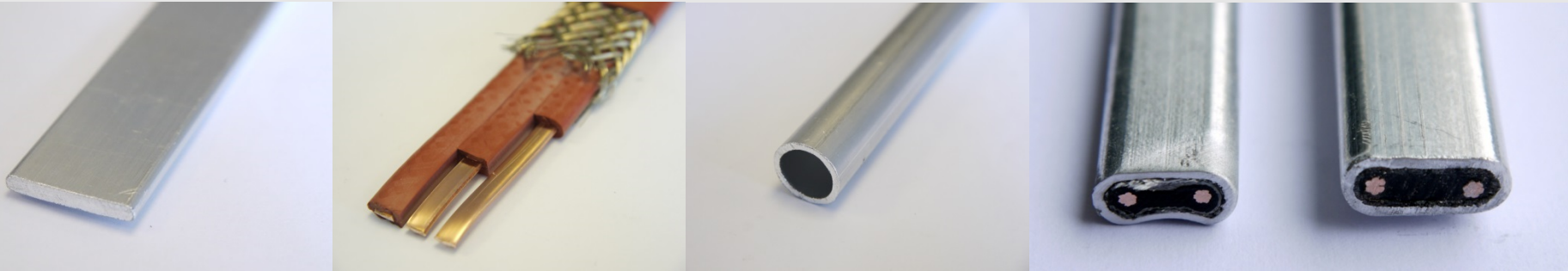
INVESTMENT IN CONTINUOUS METAL EXTRUSION FACILITY

2011

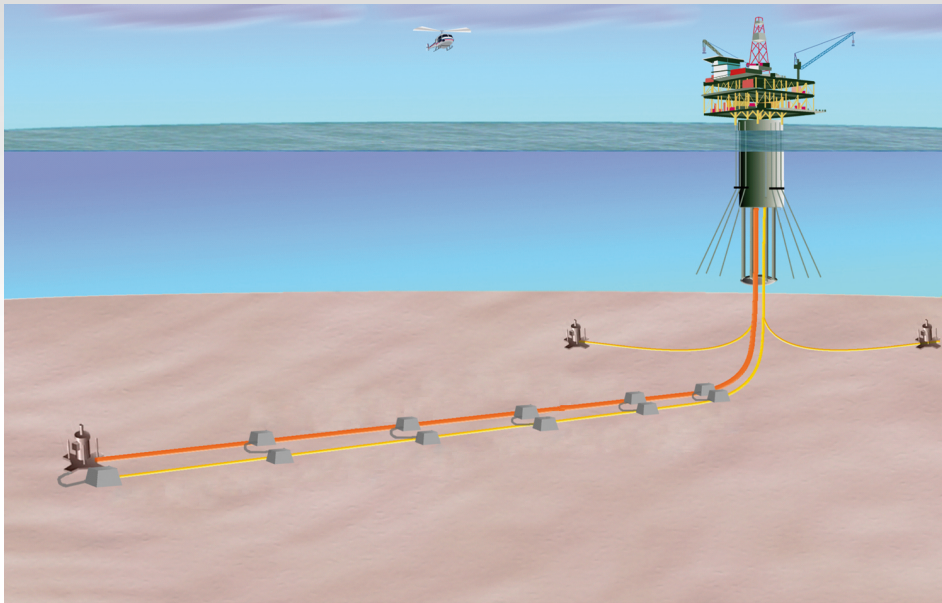
Investment in Conform Machine



- New Products from HeatAl Project
- Continuous metal extrusion facility



• New Products from HeatAI Project



- The world's first electrically trace heated subsea pipe-in-pipe oil flowline
- Great potential for heating other offshore piping

New Products from HeatAl Project

- New patent protected cable **designs** for new challenges:
 - Low cost, energy efficient cables for long distance heated pipelines, buried or sub-sea
 - Circular heaters for long circuits, Downwell heating, Self-regulating or series resistance



- New designs of heater for high voltage rail, catenary wires etc

New Products from HeatAl Project

- New **materials** for higher temperature and power, plus filling gaps in the market:
 - Aluminium alloy conductors for Long pipelines. Huge cost reduction. Significant connections development



- Core-conductor contact optimisation for cable robustness in harsh environments (high HTEE priority)
- New materials being sourced for nuclear acceptance

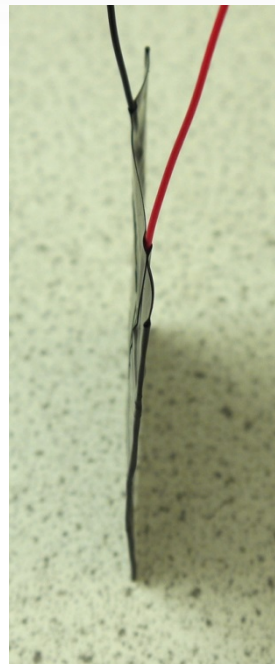
• New Products from HeatAl Project

UGANDA PROJECT

- 1250km x 24" buried pipeline
- Largest ever trace heated pipeline
- Maximise circuit lengths
- 120km in a single heating circuit
- 6.6kV supply voltage

• New Products from HeatAl Project

Thin self-regulating 'sandwich' heater, aluminium foils, polymeric heating element

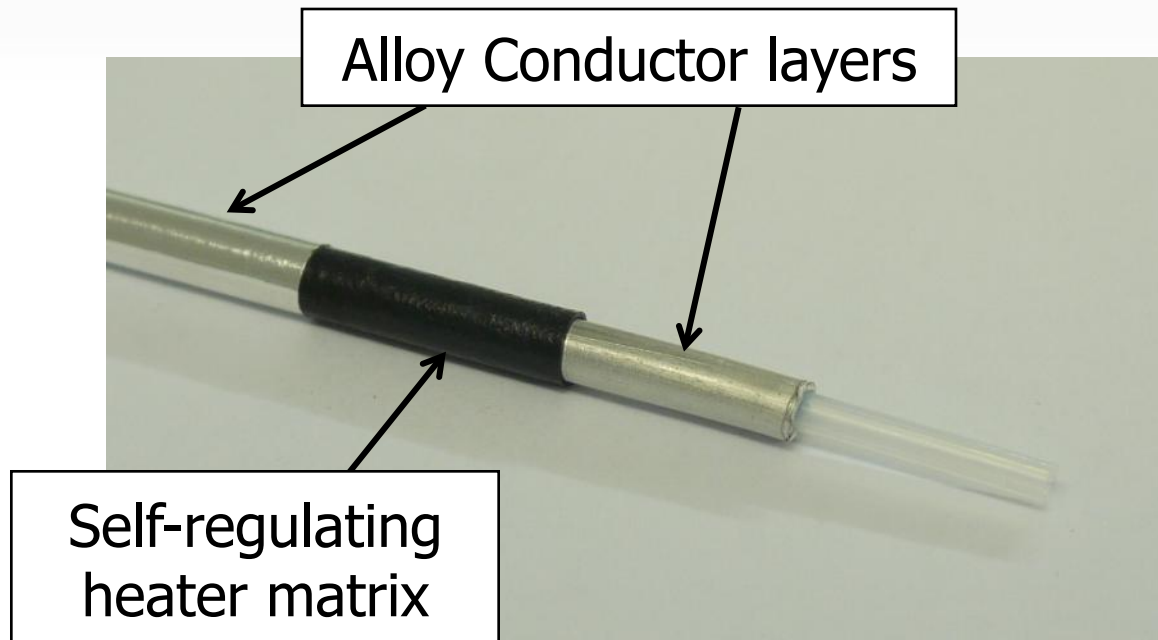


- Thin and flexible
- Self-regulating
- Only 0.5mm thick (+insulation)
- Any voltage
- Can be any shape
- Much cheaper than existing solution!

• New Products from HeatAl Project

Extruded multilayer **heated tubes** give better energy efficiency than standard straight or spiralled pipe tracing:

- Multiple layers of extrusion, including continuous extrusion of metal conductor layers



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IN SUMMARY

FOR THIS PROJECT, THE UoM HAS ACTED AS A CATALYST IN TRANSLATING THE CONCEPT INTO PRODUCTS BY PROVIDING EVERYTHING THAT WE, THE SME, LACKED - PERSONNEL, EQUIPMENT, FACILITIES, KNOWLEDGE.

THE SME LINK TO THE UNIVERSITY IS AN OBVIOUS, NATURAL AND AUTOMATIC ONE.

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***THANK YOU FOR
YOUR ATTENTION***