

ENERGY SAVING, HIGH EFFICIENCY COMPRESSED AIR TREATMENT

LEAD ORGANISATION

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PARTNERS

The University of Bath

COST AND DURATION

The Carbon Trust contribution towards this project is £230,173. The project started in October 2007 and is due for completion in September 2009

PROJECT REFERENCE NUMBER

075-048

OBJECTIVES

The objective of this project is to design and develop a new compressed air treatment (CAT) system based on NANPOR™ regenerative adsorbent hollow fibre.

The technology will be brought to the prototype stage where it will be trialled by selected customers to prove its energy saving potential and commercial interests.

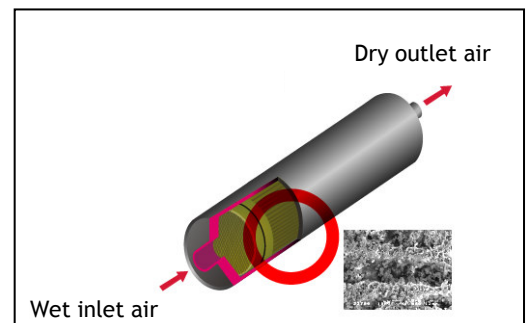
SUMMARY

It is estimated that compressed air generation accounts for 10% of the total electricity used by UK industry. Up to 20% of this energy is used by the air treatment system; pressure drop and regeneration of the drier are the main causes of this energy use.

Fibres have a very high surface-to-volume ratio and incorporate well-known adsorbent materials into a structure that can contain highly interconnected nano-porosity, ideal for the effective separation of contaminants contained in compressed air (e.g. water, oil and particulates).

The University of Bath has developed a new type of regenerative adsorbent hollow fibre called NANPOR™ that significantly reduces the pressure drop and enables fast regeneration times. Used in a CAT system, the new fibre will provide the following benefits:

- Lower energy consumption
- Smaller compressor unit (less power needed)
- Less heat required for regeneration
- Lowest physical footprint compared with equivalent existing systems
- Easy retrofit
- Broad market potential.



NANPOR™ hollow fibre module

Nano-porous Solutions Ltd (n-psl), a newly established company, has been formed to develop and commercialise this energy efficient nano-porous adsorption technology.

During this project, n-psl will:

- Develop a new regenerative adsorbent hollow fibre to be used in the CAT system
- Design, test and build a demonstrator that will prove significant energy savings by efficient and fast regeneration, and low pressure drop
- Design and build equipment to prove the cost-effective and environmentally compatible production of the fibre
- Verify the cost of the product for commercial viability
- Supply samples for evaluation to key target customers to establish their acceptance of the technology.

Overall, it is estimated that the minimum accumulated savings to 2050 of using this technology would be over 4 million tonnes of CO₂ (based on market penetration estimation and probability of success for each product category).