

ASTUTE Industrial Collaborations

Updated: 30th June 2015

This database includes only industrial collaborations carried out under the ERDF funded ASTUTE project on a shared cost basis.

Collaborations are entered into the system once contractual arrangements have been completed and this database is updated regularly.

Please Search via the drop down boxes - company, technical area, ASTUTE Academic Partner or status of project, only one search criteria can be viewed at a time.

Title: Research into Liquid Flow Patterns Through Micro Nozzles

Company: Kautex Textron CVS Ltd.

Technical Area: Automotive

ASTUTE Academic Partner: Swansea University

Status: Completed

Duration: July 2012 - October 2012

Abstract: This project is to conduct research using a High Speed Camera into the oscillating flow of water as it exits a fluidic chip. Analysis of the flow will also be conducted to assist the company in developing such fluidic chip nozzles for use in their products.

Title: Casting of Cobalt Alloys (Phase 1).

Company: Weartech International Limited

Technical Area: Other Technology - Process Optimisation

ASTUTE Academic Partner: Swansea University

Status: Completed

Duration: August 2011 - December 2011

Abstract: The proposed project will investigate the nature and cause of inclusions that can be found in cast cobalt alloy. These particles can have a negative effect on product quality. Their possible effect will be determined via metallographic examination of samples of the material from various stages of the production process. In addition computer simulations of the casting process will aid in understanding the flow of liquid metal and heat in the mould and casting, with a view to increasing yield. Consideration of appropriate locations for thermocouples to be incorporated in the mould will also be given (for subsequent modelling simulations).

Title: Investigation into Feasibility of Use of Additive Layer Manufacturing

Company: Airborne Systems Ltd.

Technical Area: Advanced Materials

ASTUTE Academic Partner: Swansea University

Status: Completed

Duration: March 2013 - July 2013

Abstract: This project is to conduct an investigation into the feasibility of manufacturing a particular component by Additive Layer Manufacturing (ALM). This is the first phase of work which will analyse component build quality of the current component design and demonstrate basic viability of the material.

Title: Preliminary Research into the Distribution of the Stress Tensor within a Cast Aluminium Lighting Post Hinge.

Company: Aluminium Lighting Company Limited

Technical Area: Advanced Materials

ASTUTE Academic Partner: Swansea University

Status: Completed

Duration: February - April 2014

Abstract: The aim of the current project is to investigate the distribution of stresses with respect to input loadings, in an Aluminium lighting column, in particular the cast hinge component. This will assist ALC with their understanding and knowledge of distribution of these stresses. Finite Element analysis (FEA) will be carried out on the cast hinge part, using typical loadings (As provided by ALC).

Title: Flow and Thermal Modelling of Heart Pumps

Company: Calon Cardio Technology Ltd.

Technical Area: Other Technology - Computational Modelling

ASTUTE Academic Partner: Swansea University

Status: Completed

Duration: May 2011 - September 2011

Abstract: The project is set up as an opportunity for the company to gain an insight into the flow patterns encountered within blood pumps of different configuration, axial or radial. ASTUTE will use these case studies to further develop CFD capability with special consideration of blood rheological properties and haemolysis. Thermal modelling will also be carried out and a method devised to assess the flow dependent heat transfer properties between the device, blood and tissue.

Title: Optimisation of Manufacturing Process for Rotary Diamond Dressers - Phase 1.

Company: Consort Precision Diamond Co. Ltd.

Technical Area: Other Technology - Process Optimisation

ASTUTE Academic Partner: Swansea University

Status: Completed

Duration: March 2011 - April 2011

Abstract: This will be a preliminary study of materials and process parameters associated with the manufacture of Rotary Diamond Dressers at Consort Precision Diamond. It is anticipated that this will initially benefit the enterprise in terms of increased knowledge of factors that affect product quality and could lead to a second phase project of longer duration.

Title: Computational Simulation and Economic Analysis of a Steam line Heating System for Natural Gas

Company: Ledwood Mechanical Engineering

Technical Area: Other Technology - Oil & Gas Industry

ASTUTE Academic Partner: Swansea University

Status: Completed

Duration: April 2012 - November 2012

Abstract: The project will involve techno-economic assessment, cost-benefit analysis and computational modelling of a steam line heating system for natural gas distribution. The modelling work will encompass thermal heat transfer and fluid mechanics predictions.

Title: Failure Analysis of Two Polymer Injection Tool Components

Company: FSG Tool and Die Ltd.

Technical Area: Advanced Materials

ASTUTE Academic Partner: Swansea University

Status: Completed

Duration: June 2011 - April 2012

Abstract: The aim of the project is to utilise metallographic analysis and finite element modelling to allow the company to determine the failure mechanism in injection moulding tools.

Title: Research into Wind Induced Low Cycle Fatigue of Novel Lighting Columns.

Company: Aluminium Lighting Company Limited

Technical Area: Advanced Materials

ASTUTE Academic Partner: Swansea University

Status: Completed

Duration: April 2014 - August 2014

Abstract: The Aluminium Lighting Company is developing novel designs for extruded aluminium lighting columns which can provide many benefits over conventional steel columns. The proposed project will undertake research into wind induced low cycle fatigue of aluminium columns. Working with company staff, Swansea University will utilise its expertise in computational fluid dynamics to predict stress distributions in the columns that result from wind induced oscillations, and its capabilities in high resolution microscopy to study potential sites of fatigue failure in the aluminium alloy.

Title: A Feasibility Study for Blood Flow Modelling Through Blood Oxygenators

Company: Haemair Ltd.

Technical Area: Medical

ASTUTE Academic Partner: Swansea University

Status: Completed

Duration: January 2011 - March 2011

Abstract: The project will investigate the capability of computational fluid dynamics for modelling the flow of blood through fibrous oxygenators. The research will focus on modelling flow through fibre beds with comparison to experimental measurements.

Title: Research into Transient Magnetic Phenomena.

Company: Silverwing UK Ltd.

Technical Area: Other Technology - Electromagnetic Computer Modelling

ASTUTE Academic Partner: Swansea University

Status: Completed

Duration: November 2013 - June 2014

Abstract: This project is to conduct research into transient magnetic phenomena to assist in understanding of the magnetic fields induced during magnetic flux leakage non-destructive testing. The aim of the project is that the understanding gained will assist the company in making future product enhancements to their magnetic flux leakage NDT systems.

Title: Feasibility Study using Preparation and Characterisation for New Materials and Substrates for Organic Electronics

Company: SmartKem Ltd.

Technical Area: Opto-Electronics

ASTUTE Academic Partner: Bangor University

Status: Completed

Duration: February 2012 - May 2012

Abstract: The feasibility study is to assist the company in assessing the feasibility of a number of candidate active materials and substrates for organic electronics.

Title: Modelling Hydraulic Efficiency of Blood Pumps

Company: Calon Cardio Technology Ltd.

Technical Area: Other Technology - Computational Modelling

ASTUTE Academic Partner: Swansea University

Status: Completed

Duration: December 2011 - May 2013

Abstract: The project is set up to research the capability of computational fluid dynamics to predict the hydraulic efficiency of blood pumps. The research will focus on ensuring that the chosen flow

model yields an accurate pressure rise and flow rate at given conditions and that the model responds correctly to variations in the geometry and operating conditions of the pump.

Title: Feasibility Study to Consider the Implementation of Laser Doppler Flowmetry

Company: Vital Smiles Systems Ltd.

Technical Area: Medical

ASTUTE Academic Partner: Swansea University

Status: Completed

Duration: September 2011 - September 2011

Abstract: The objective of the project is to undertake a feasibility study to consider the implementation of laser doppler flowmetry and oximetry algorithms for a concept medical device.

Title: Failure Analysis of Two Polymer Injection Tool Components (Phase 2)

Company: FSG Tool and Die Ltd.

Technical Area: Advanced Materials

ASTUTE Academic Partner: Swansea University

Status: Completed

Duration: September 2012 - October 2012

Abstract: This is a follow-on project that will use finite element analysis to examine the stress development in injection moulding tools that have been redesigned by the company. This should enable a much greater service life for the tools.

Title: Casting of Cobalt Alloys (Phase 2).

Company: Weartech International Limited

Technical Area: Other Technology - Process Optimisation

ASTUTE Academic Partner: Swansea University

Status: Completed

Duration: December 2011 - June 2012

Abstract: Investigation into the underlying failure mechanism of tooling used on cast Cobalt alloy. Previous studies demonstrated that the castings contained minute hard inclusions- however these are not necessarily the cause of the tool failure.

Reduce the cost of each casting by increasing yield, reducing material revert and removing or minimising post-process costs. Previous computational models demonstrated that 20-30% material reductions were achievable; this phase requires experimentally measured alloy properties to confirm this saving.

Title: CFD for Blood Damage Modelling in VADs

Company: Calon Cardio Technology Ltd.

Technical Area: Other Technology - Computational Modelling

ASTUTE Academic Partner: Swansea University

Status: Completed

Duration: July 2013 - June 2014

Abstract: The project aims to use computational fluid dynamics (CFD) expertise to carry out research into the effects of varying clearances and rotor blade shapes in a blood pump. The company supplies case studies from its design cycles while Swansea University project officers develops the CFD research toolset to establish pump performance and extends it to blood damage prediction. The benefit to the company is the prediction of pump performance based on up to date research while the research group benefits from industry-based case studies on which to base their research.

Title: Optimisation of Manufacturing Process for Rotary Diamond Dressers - Phase 2.

Company: Consort Precision Diamond Co. Ltd.

Technical Area: Other Technology - Process Optimisation

ASTUTE Academic Partner: Swansea University

Status: Completed

Duration: May 2011 - April 2012

Abstract: Following on from a short Phase 1 project, it is now proposed that a more extensive phase 2 project will investigate the liquid infiltration of tungsten powders during the manufacture of Rotary Diamond Dressers. This will include a laboratory-based series of experiments, development of a powder pouring rig and computer modelling activities.

Title: Research into the Scale Effects of VAWTs Through CFD Modelling

Company: C-FEC Ltd.

Technical Area: Other Technology - Renewable Energy

ASTUTE Academic Partner: Swansea University

Status: Completed

Duration: April 2011 - June 2011

Abstract: Extensive research will be conducted into the effect of scaling of vertical axis wind turbines to assess its effect on the energy output. The research methodology will use the company's designs to explore the response of the turbine, in particular to Reynolds number. Power output mapping under a range of conditions will be obtained and converted to forecast annual energy output. This will enable the company to build a cost of energy model.

Title: Micro and Macro-modelling of Fibre-based Blood Oxygenators

Company: Haemair Ltd.

Technical Area: Medical

ASTUTE Academic Partner: Swansea University

Status: Completed

Duration: March 2012 - October 2012

Abstract: The project will study flow through blood oxygenators. As a research study, the work includes cross-correlation studies between micro and macro-modelling techniques as well as comparison with experimental data. Micro-modelling techniques will enable the characterisation of anisotropic media permeability for non-Newtonian blood flow. The macro-models can then be used to simulate the oxygenators in their entirety. A study of simple blood oxygenation models will also be carried out.

Title: Research into Liquid Flow Patterns Through Micro Nozzles

Company: Kautex Textron CVS Ltd.

Technical Area: Automotive

ASTUTE Academic Partner: Swansea University

Status: Completed

Duration: June 2013 - December 2013

Abstract: This project represents the first phase of a potential 3, and involves investigating the feasibility of developing CFD modelling techniques to analyse and predict the fluid flow in fluidic chip nozzles. Experimental measurements of a fluidic nozzle will be made with which to compare and validate the CFD analysis. The aim of the project is to increase confidence in the use of CFD during the design process of fluidic chip nozzles.

Title: Computational Thermo-Mechanical Fatigue Modelling and Metallurgy of Lead-Free Solders in Power Modules

Company: Electronic Motion Systems UK Ltd.

Technical Area: Advanced Materials

ASTUTE Academic Partner: Swansea University

Status: Completed

Duration: May 2011 - February 2012

Abstract: The project will initially use computer modelling to research the thermal fatigue modelling

of solder joints during in service thermal cycles and thermal shock conditions. This will be followed by a metallurgical investigation of a range of alternative solder materials.

Title: Scanning and CAD Reconstruction of Various Food-Moulds for Bespoke Vacuum-Forming Tools

Company: FSG Tool and Die Ltd.

Technical Area: Other Technology - Computational Modelling

ASTUTE Academic Partner: Swansea University

Status: Completed

Duration: July 2012 - August 2012

Abstract: The objective of this short collaboration is to investigate the feasibility of using 3D scanning to generate CAD files as a suitable starting point for the company's designers to produce moulds for NHS food products.

Title: Feasibility Study Into Use of Composite Materials for Aerial Delivery Platform

Company: Airborne Systems Ltd.

Technical Area: Advanced Materials

ASTUTE Academic Partner: Swansea University

Status: Completed

Duration: June 2013 - January 2014

Abstract: This project is a feasibility study into the use of composite materials to replace some of the components in an aerial delivery equipment platform. If the concept is shown to be feasible the company will be able to develop their current design to incorporate composite components and reduce the mass of their systems.

Title: Magnetic Bearing Modelling - A Feasibility Study

Company: Calon Cardio Technology Ltd.

Technical Area: Other Technology - Computational Modelling

ASTUTE Academic Partner: Swansea University

Status: Completed

Duration: September 2013 - March 2014

Abstract: The project aims to develop simple numerical models for magnetic bearing. The output from the models is a set of characteristic response curves for combined axial and radial loads against axial and radial bearing misalignments. ASTUTE will focus on modelling technology while the company provides experimental data for validation. The research will review the model discretisation in particular. It is a preliminary study to assess the feasibility of a multiphysics exploration project of heart pumps.

Title: Technologies for Joining Axle Stubs to Square Bar

Company: Knott Avonride Ltd.

Technical Area: Automotive

ASTUTE Academic Partner: Swansea University

Status: On-hold

Abstract: The purpose of this proposed ASTUTE project is to investigate different methods of joining the axle end to the square hollow section, without play between the two components, prior to welding. Assessment will be via FE simulations accompanied by experimental validation.

Title: Advanced Structural Optimisation Techniques for Standard Regulated Structures

Company: C-FEC Ltd.

Technical Area: Other Technology - Renewable Energy

ASTUTE Academic Partner: Swansea University

Status: Completed

Duration: June 2011 - June 2012

Abstract: The cost of energy is a decisive factor in the success or failure of renewable energy project.

To minimise this cost, C-FEC are seeking assistance from ASTUTE to create a methodology which would optimise the wind turbine structure while conforming to the applicable standards. Advanced tools for topological optimisation and discrete truss optimisation will be assessed and combined to produce a robust structural optimisation method.

Title: Computer Simulation of Cast Brake Component

Company: Melloy Ltd.

Technical Area: Other Technology - Computational Modelling

ASTUTE Academic Partner: Swansea University

Status: Completed

Duration: February 2012 - May 2012

Abstract: The project will involve computer simulation of the casting process for an aluminium alloy brake component. This will enable an improved lightweight product.

Title: Stress Evaluation in Nickel Plated Rotary Dressers and Diamond Recycling Options

Company: Consort Precision Diamond Co. Ltd.

Technical Area: Other Technology - Electroplating for Manufacture

ASTUTE Academic Partner: Swansea University

Status: Completed

Duration: October 2012 - April 2015

Abstract: The company have been electroplating for almost 40 years and whilst they produce excellent quality parts via their current methods they would like to be brought up to date with recent technological advances in the field. Ideally the aim would be to “plate the perfect plate” with no stresses or distortion in the final component. In addition the company are looking to recycle diamonds – a short laboratory based study will focus on various chemical cleaning processes followed by an assessment of their effectiveness.

Title: Research into Wind-Induced Low Cycle Fatigue of Novel Aluminium Lighting Columns- Full Scale Measurement Phase II.

Company: Aluminium Lighting Company Limited

Technical Area: Advanced Materials

ASTUTE Academic Partner: Swansea University

Status: Completed

Duration: September 2014 - April 2015

Abstract: The Aluminium Lighting Company is developing novel designs for extruded aluminium lighting columns which can provide many benefits over conventional steel columns. A previous project with Astute (LS243) has provided a predictive insight into the stress distributions within aluminium lighting columns under applied loads. In particular Dynamic FEA analyses demonstrated that weld-free columns with a type 5 press-stressed inner-tube display lower magnitude stress fields than similar structures containing a welded C section inner tube. This project will undertake practical research into wind induced low cycle fatigue of aluminium columns to support the previously presented theoretical predictions. The aim is to provide complete picture of the stress state and damage of aluminium lighting columns, combined with the FEA analyses from Project LS253 it is anticipated that the current study will provide useful information on the structural behaviour and a key for the interpretation of collapses and damage causes. It is important to note that previous fatigue studies of lighting poles are relatively scarce and those that do exist are primarily focussed upon steel structures and/or analytical formulation and laboratory tests with the application of idealised “Non-real” wind oscillations.

Title: Optimisation for Processing of Advanced High-Strength Steels via Port Talbot Steelworks

Company: Tata Steel and Metamet Consultants Ltd.

Technical Area: Advanced Materials

ASTUTE Academic Partner: Swansea University

Status: Completed

Duration: May 2011 - August 2012

Abstract: This project will look at various ways of optimising high-strength steel manufacturing (composition, process and heat treatment) at Port Talbot steelworks. The plan is to divide the project into two parts: (1) exploration of alternative production processes to manufacture advanced high-strength steel; and (2) optimisation of hot mill rolling practices.

Title: Multiphysics Modelling of VAD

Company: Calon Cardio Technology Ltd.

Technical Area: Other Technology - Computational Modelling

ASTUTE Academic Partner: Swansea University

Status: Completed

Duration: July 2014 - April 2015

Abstract: The project is set up to assist Calon-Cardio Technologies Ltd in the development of a ventricular assist device with novel research techniques. The company provides industry based case studies while ASTUTE researches and validates novel modelling technologies in the biomedical field of application. Based on prior collaborative research, this project focuses on modelling and validating blood damage models, the dissipation of the heat generated and the response of the magnetic bearings. Provision is made for the development of models in open source software to enable a greater depth of new development than the closed-source commercial alternatives.

Title: Research into the Effects of Phase Transformations in Cobalt Alloys produced by Centrifugal and Sand Casting Casting of Cobalt Alloys (Phase 3).

Company: Weartech International Limited

Technical Area: Advanced Materials

ASTUTE Academic Partner: Swansea University

Status: Completed

Duration: May 2014 - March 2015

Abstract: The proposed project will investigate the effects of phase transformations that occur during solidification of cobalt alloys. Weartech International Ltd. manufacture a range of these alloys via different casting processes. The research will examine the microscopic structure and mechanical properties of the cast alloys comparing these manufacturing techniques; with and without post-casting treatments. Computer modelling of the heat and fluid flow during casting will be also be used. This work should enable the company to develop a more efficient manufacturing process and exploit increased market demand for these alloys.

Title: Optimisation of a Blood Oxygenator/Heat Exchanger

Company: Haemair Ltd.

Technical Area: Medical

ASTUTE Academic Partner: Swansea University

Status: Completed

Duration: March 2013 - December 2013

Abstract: The project aims to develop modelling techniques and investigate optimisation methodology for blood oxygenators. The first phase of the project will look at developing and implementing a mathematical model for gas exchange between the blood and the fibres, to be validated in the second phase against experimental data. The third phase of the work will look at making use of this model in the context of geometric optimisation, in particular of the inlet and outlet ports to direct the flow and achieve a homogeneous oxygenation of the blood.

Title: Research on Bonderized 16MnCr5M Steel for Deep Drawing

Company: Schaeffler (UK) Ltd.

Technical Area: Automotive

ASTUTE Academic Partner: Swansea University

Status: Completed

Duration: March 2014 - August 2014

Abstract: The Project with Schaeffler will investigate a variety of comparative surface techniques to determine whether differences exist between batches of supplied coils. Being able to detect differences would enable the company to determine which specification is best suited to achieve higher productivity levels. If differences are highlighted, Astute will help to develop a “Spot” test for quick “On-site” analysis. In addition the mechanical properties of the various batches of coil material will be explored, again to see if noticeable differences exist.

Title: Response of Friction Materials to Contaminants

Company: C-FEC Ltd.

Technical Area: Other Technology - Renewable Energy

ASTUTE Academic Partner: Swansea University

Status: Completed

Duration: February 2014 - June 2014

Abstract: The project aims to investigate the suitability of toothed belts to be used as friction belts. The use of both sides of a belt was identified as a potential advantage. The research carried out by ASTUTE will focus on exploring experimentally the friction properties of the belt material under a range of conditions. Of particular interest is the change in friction coefficient due to temperature variations and contaminants. The company's contribution consists of assessing power transmission requirements for different rotor sizes to calculate the required belt width based on empirical models from the literature.

Title: Use of High Performance Computing to Solve Thermal-Fluid Structural Fatigue Simulations (with HPC Wales)

Company: Calsonic Kansei Europe Plc

Technical Area: Other Technology - Computational Modelling

ASTUTE Academic Partner: Swansea University

Status: Completed

Duration: November 2012 - August 2013

Abstract: The objective is to use computational fluid dynamics (CFD) and other computer simulation techniques to research how thermal cycling affects temperature distributions and resulting stress fields in automotive radiators. The project will also involve collaboration with High Performance Computing Wales.

Title: CFD/Thermal Analysis of the Cyclone-Extraction System for a Lead Recycling Smelter

Company: Envirowales Ltd.

Technical Area: Other Technology - Computational Modelling

ASTUTE Academic Partner: Swansea University

Status: Completed

Duration: September 2012 - February 2013

Abstract: The project is set-up to investigate the efficiency of a cyclone extraction system, particularly the mixing of cold and hot air incoming streams. This work will explore the possibility of running the furnaces at a higher operating power, to enable a safe increase of the plant output while maintaining the health and safety standards and further reducing the environmental impact.

Title: Research Into Use of Metal Additive Layer Manufacturing for Aircraft Components

Company: Airborne Systems Ltd. & Renishaw Plc

Technical Area: Advanced Materials

ASTUTE Academic Partner: Swansea University

Status: Completed

Duration: September 2013 - November 2014

Abstract: This project is to conduct research to assess the feasibility of Additive Layer Manufacturing (ALM) as a manufacturing route for an aerial delivery release mechanism. Computational driven design will be used to optimise components for weight reduction and for ALM production. Characterisation of metal powders required for the build will also be conducted.

Title: A Review of the Factors Affecting Stress Corrosion Cracking in Waste Heat Recovery Systems

Company: Econotherm UK Ltd.

Technical Area: Advanced Materials

ASTUTE Academic Partner: Swansea University

Status: Completed

Duration: April 2012 - May 2012

Abstract: The aims of this project are to conduct a scientific literature review of the phenomenon of stress corrosion cracking (SCC) in steel-based waste heat recovery systems and to examine potential methods of reducing the extent of SCC by the application of barrier coatings etc.

Title: FMEA and Ontology Design to Improve Productivity During the Manufacture of Commercial Workboats

Company: Mustang Marine (Wales) Ltd.

Technical Area: Other Technology - Failure Modes Effects Analysis

ASTUTE Academic Partner: Swansea University

Status: Completed

Duration: February 2011 - May 2014

Abstract: The objective of this project is to investigate and embed the FMEA philosophy in the design and manufacturing process of vessel construction and also to assist in developing a product lifecycle management system to eliminate failure through life.

Title: Alternative Materials for Pain Relief Device

Company: Pulse MedTech Ltd.

Technical Area: Advanced Materials

ASTUTE Academic Partner: Swansea University

Status: Completed

Duration: April 2011 - June 2011

Abstract: The project is a scoping study into alternative polymers for use on a vibrating pain relief device. The material will be placed next to the skin of the patient and therefore the current rigid plastic is not deemed to be sufficiently comfortable.

Title: Understanding the Physical Properties of Silicon Rubber Adhesive

Company: GTS Flexible Materials Ltd.

Technical Area: Advanced Materials

ASTUTE Academic Partner: Swansea University

Status: Completed

Duration: May 2012 - May 2013

Abstract: The objective of the project is to improve understanding of a new silicon rubber adhesive and its interaction with the reverse roller coating process. The project will compare the existing and new adhesive formulae and undertake a review of the coating machine configuration.

Title: CFD and Design Optimisation of Heat Transfer in Marine Vessel Engine Rooms

Company: Mustang Marine (Wales) Ltd.

Technical Area: Other Technology - Computational Modelling

ASTUTE Academic Partner: Swansea University

Status: Completed

Duration: January 2012 - December 2013

Abstract: The objective of the project is to use Computational Fluid Dynamics (CFD) and heat transfer modelling to understand and optimise the airflow and temperature throughout the engine room so that best working practices can be incorporated into future design rules.

Title: Experiments for Validation of CFD on a Large Scale Model

Company: C-FEC Ltd.

Technical Area: Other Technology - Renewable Energy

ASTUTE Academic Partner: Swansea University

Status: Completed

Duration: March 2014 - April 2015

Abstract: The project aims to assist the company in setting up an experimental methodology to test the performance of their large scale model with a view to validate their computer model predictions to date. ASTUTE's role is to establish an experimental protocol and crucially a data processing method. In addition, the model is a long term test bed for the company, thus yielding a very large dataset. The project therefore aims to research and implement an efficient data mining technique to automate the recognition of test points in a dataset with parameters outside the experimentalist's control (wind speed and direction), thus rendering the entire dataset useful for query rather than relying only on preconceived test points.

Title: Blood Flow Path Optimisation Through an Oxygenator with Manufacturing Constraints

Company: Haemair Ltd.

Technical Area: Medical

ASTUTE Academic Partner: Swansea University

Status: Completed

Duration: May 2014 - April 2015

Abstract: The project is set up as a detailed investigation of blood flow and pressure drop through a blood oxygenator. The work will be based on reviews of manufacturability conducted jointly by ASTUTE and the company. The computational fluid dynamics expertise at ASTUTE will be used to model the flow through the device with a particular attention to stagnation regions and residence time. This will enable the company to create a hemodynamically optimised device. The devices will support the research into numerical models for non-Newtonian fluids through porous media by the ASTUTE team.

Title: Research into Energy Efficiency of Coal Drying Process

Company: Maxibrite Ltd.

Technical Area: Other Technology - Plant Energy Efficiency

ASTUTE Academic Partner: Swansea University

Status: Completed

Duration: July 2014 - March 2015

Abstract: The project is set up to investigate the heat transport throughout the coal drying process. Little research has been published on coal drying. Potential gains in efficiency can be achieved by devising an experimental protocol which will analyse the flow path of material and heat through the system. This is an opportunity to document scientifically a process developed through empirical knowledge, which will lead economic and environmental improvements.

Title: Research into Liquid Flow Patterns Through Micro Nozzles

Company: Kautex Textron CVS Ltd.

Technical Area: Automotive

ASTUTE Academic Partner: Swansea University

Status: Completed

Duration: July 2014 - May 2015

Abstract: This project is the second phase of a project on the experimentation and CFD analysis of fluidic chip nozzles. The project's primary aim is to confirm the performance criteria of a nozzle through experiments and measurements made using high speed photography and also through CFD analysis. The project's secondary aim is to increase the understanding of the fluid flow within this nozzle to allow nozzle performance characteristics to be met through geometry design changes.

Title: Optimization of Magnetic Motors - Phase 1

Company: Electronica Products Limited

Technical Area: Other Technology - Power Conversion Devices

ASTUTE Academic Partner: Cardiff University

Status: Completed

Duration: January 2012 - October 2012

Abstract: This project involved magnetic circuit analysis of permanent magnet Brushless DC motors to prevent demagnetisation and assess the compatibility of winding configurations.

Title: Development of Eco Briquette

Company: Maxibrite Ltd.

Technical Area: Other Technology - Environmental Product

ASTUTE Academic Partner: Cardiff University

Status: Completed

Duration: June 2014 - October 2014

Abstract: This project is to analyse biomass samples to be incorporated within a coal briquette to improve the environmental product performance.

Title: Fly Line Innovation Through Increased Product Functionality

Company: Fishtec

Technical Area: Other Technology - High Value Manufacturing

ASTUTE Academic Partner: Cardiff University

Status: Completed

Duration: November 2010 - January 2012

Abstract: The aim of this project was to investigate die configuration and material used in novel fly-fishing uses and carrying out a benchmarking exercise.

Title: Micromachining Laser Vision

Company: Laser Wire Solutions Ltd.

Technical Area: Opto-Electronics

ASTUTE Academic Partner: Cardiff University

Status: Completed

Duration: August 2014 - January 2015

Abstract: The aim of this project is to develop coding to control the positioning of lasers.

Title: Security Technology - Phase 1

Company: Catcelt Ltd & Knight Fire and Security Products Ltd.

Technical Area: Opto-Electronics

ASTUTE Academic Partner: Cardiff University

Status: Completed

Duration: January 2012 - June 2012

Abstract: The phase 1 project involved the testing of a new product for security applications involving a high potency chemical which emits light using a specific wavelength.

Title: Feasibility of Radio Communication from Water to Air

Company: BVG Airflo Ltd.

Technical Area: Other Technology - Opto-Electronics & Wireless Communication

ASTUTE Academic Partner: Cardiff University

Status: Completed

Duration: December 2011 - July 2012

Abstract: This project was investigating the feasibility of selecting a suitable underwater device and identification of communications and analysis of available power sources.

Title: Optimisation Study of Medical Device

Company: Cyden Ltd.

Technical Area: Opto-Electronics

ASTUTE Academic Partner: University of Wales Trinity Saint David

Status: Completed

Duration: April 2013 - August 2014

Abstract: A specialist computational model has been developed at UWTSU over twenty years that models the radiative and thermal transport problem of incident light on human skin. This model includes the bio-physics that describes light-tissue interaction.

Cyden Ltd. wished to enhance its understanding of the biophysical processes involved in light-tissue interaction. The model was able to vary the principal device parameters such as temporal pulse profile and spectral distribution in order to identify the optimal values for best therapeutic effect. The computational model identified the optimal incident light pulse parameters required for different skin types in order to achieve the best therapeutic effect.

A new product, targeted at the home-use domestic market, has been launched internationally in 2014 that has benefited from the optimisation study undertaken.

Title: Proof of Concept investigation of a Cement Mixer Drum Lid

Company: The Washguard Ltd.

Technical Area: Advanced Materials

ASTUTE Academic Partner: Cardiff University

Status: Completed

Duration: October 2012 - May 2013

Abstract: The project assisted the company to advance their patented idea to specify materials using FEA software and material selection.

Title: Pre Product Proof of Concept of New Medical Device

Company: Tredegar Medical Ltd.

Technical Area: Medical

ASTUTE Academic Partner: Cardiff University

Status: Completed

Duration: July 2013 - July 2014

Abstract: This project is helping to produce a pre-product concept model of a new medical device.

Title: Development of Methodologies for the Estimation of High-Cycle Fatigue Life of Vertical Axis Wind Turbine Generators

Company: Matilda's Planet Manufacturing Ltd.

Technical Area: Other Technology - Renewable Energy

ASTUTE Academic Partner: Cardiff University

Status: Completed

Duration: October 2013 - January 2014

Abstract: This project is to provide support for FEA design work to help the company understand high-cycle fatigue behaviour and to develop guidelines for analysis of fatigue in their future designs.

Title: Safety System for Turning Off the Mains Water Supply

Company: Leeksafe Ltd.

Technical Area: Other Technology

ASTUTE Academic Partner: Cardiff University

Status: Completed

Duration: November 2013 - March 2014

Abstract: The aim of this project was to identify and develop an energy efficient control system for an existing concept.

Title: Invacare Layout Review

Company: Invacare Ltd.

Technical Area: Other Technology - Manufacturing Systems

ASTUTE Academic Partner: Cardiff University

Status: Completed

Duration: January 2013 - February 2013

Abstract: The project was to develop an optimised factory layout following company relocation.

Title: Gomer Press Process Mapping and Project Scoping

Company: Gomer Press Limited

Technical Area: Other Technology - Process Optimisation

ASTUTE Academic Partner: Cardiff University

Status: Completed

Duration: April 2012 - April 2012

Abstract: This project involved gathering shop floor data to identify the root causes of order production issues and propose an optimum shop floor layout.

Title: Optimisation Study of Medical Devices

Company: Energist Ltd.

Technical Area: Medical

ASTUTE Academic Partner: University of Wales Trinity Saint David

Status: Completed

Duration: July 2014 - November 2014

Abstract: A specialist computational model has been developed at UWTSU over twenty years that models the radiative and thermal transport problem of incident light on human skin. This model includes the bio-physics that describes light-tissue interaction. Energist Ltd. wished to enhance its understanding of the biophysical processes involved in light-tissue interaction. The model was able to vary the principal device parameters such as temporal pulse profile and spectral distribution in order to identify the optimal values for best therapeutic effect. The computational model identified the optimal incident light pulse parameters required for different skin types in order to achieve the best therapeutic effect. A new product, targeted at the professional clinician market, has been launched internationally in 2014 that has benefited from the optimisation study undertaken.

Title: Development and Sample Preparation of Solar Powered Solutions

Company: Lucid Lighting Ltd. (commissioned by Knight Tooling and Knight Fire & Security Ltd.)

Technical Area: Other Technology - Electronics (Solar Energy)

ASTUTE Academic Partner: Cardiff University

Status: Completed

Duration: September 2013 - May 2014

Abstract: The aim of this project was the development and product verification of ideas created by Knight Fire & Security required for mass production with Lucid Lighting completing the design, sample and production preparation.

Title: 'My Car Step'

Company: Rosies 2008 Ltd.

Technical Area: Other Technology - Design Engineering

ASTUTE Academic Partner: Cardiff University

Status: Completed

Duration: September 2012 - November 2013

Abstract: The project was to assist with the material and process selection to manufacture a design idea for an innovative child seat project including 2D and 3D modelling in support of a patent application.

Title: Finite Element Analysis (FEA) of Structural Response of Task Chair Components

Company: Orangebox Ltd.

Technical Area: Other Technology - Engineering Design

ASTUTE Academic Partner: Cardiff University

Status: Completed

Duration: April 2011 - April 2011

Abstract: This project was to carry out an FEA study of a chair design to predict performance under load testing.

Title: Point of Care (POC) Test and Proof of Concept Instrument

Company: Morvus Technology Ltd.

Technical Area: Medical

ASTUTE Academic Partner: Cardiff University

Status: Completed

Duration: July 2011 - March 2012

Abstract: This project was to define biochemical performance of a point of care diagnostic test method to ensure novel device compatibility, deliver and test a breadboard device and to identify suitable SME manufacturing partners in the Welsh Convergence Area.

Title: Salcombe Flyer 830 – Preliminary Material Testing

Company: Pembrokeshire Sports Boats

Technical Area: Advanced Materials

ASTUTE Academic Partner: Swansea University

Status: Completed

Duration: April 2011 - October 2012

Abstract: The objective of is to undertake a preliminary investigation of composite material lay-ups for the purpose of boat hull fabrication, with a view to obtaining data for subsequent numerical simulation. The emphasis is placed on mechanical properties and consistency in manufacturing quality.

Title: Frontier Medical Repose (Valves and Pumps) Lean Initiation

Company: Frontier Medical Products Ltd.

Technical Area: Other Technology - Manufacturing Systems

ASTUTE Academic Partner: Cardiff University

Status: Completed

Duration: April 2013 - June 2013

Abstract: This project was to assist the company with process improvement, and standardisation and stabilisation of processes, for their Repose pump and valve manufacturing area, and advising on improvements to monitoring production efficiency.

Title: Material Surface Characterisation

Company: Biomet UK Ltd.

Technical Area: Other Technology - Advanced Manufacturing & Tribology

ASTUTE Academic Partner: Cardiff University

Status: Completed

Duration: February 2014 - February 2015

Abstract: The aim of the project is to understand how surface characteristics affect product performance of joint implants.

Title: Frontier Medical Lean Roll Out
Company: Frontier Medical Products Ltd.
Technical Area: Other Technology - Manufacturing Systems
ASTUTE Academic Partner: Cardiff University
Status: Completed
Duration: February 2014 - April 2015
Abstract: This project is examining the available auditing techniques to find, design or modify a suitable lean maturity audit method for the company and investigate its efficacy.

Title: Ford Engine Block Machining Optimisation
Company: Ford Motor Ltd.
Technical Area: Automotive - Manufacturing Systems
ASTUTE Academic Partner: Cardiff University
Status: Completed
Duration: November 2013 - November 2014
Abstract: The aim of the project is to investigate the block and head machining lines to determine how Ford could manufacture more engines due to an increase in demand.

Title: BIS Turbougenerator Feasibility Study
Company: Business Industrial Solutions Ltd.
Technical Area: Other Technology - Energy Storage
ASTUTE Academic Partner: Cardiff University
Status: Completed
Duration: July 2012 - September 2012
Abstract: The aim of this project was to review the prototype computer performance model of a low pressure air turbine energy storage device, identifying any weaknesses and correcting them.

Title: Production Scale Processing
Company: Neem Biotech Ltd.
Technical Area: Other Technology - Food
ASTUTE Academic Partner: Cardiff University
Status: On-going
Abstract: Neem Biotech is relocating and this project will encompass assisting them with the implementation and testing of an upscaled production including an investigation into alternative technologies for the maceration of garlic.

Title: Potential Improvements to Sharps Bins
Company: Frontier Medical Products Ltd.
Technical Area: Medical
ASTUTE Academic Partner: Swansea University
Status: Completed
Duration: November 2011 - June 2013
Abstract: The project will be a materials investigation to quantify any potential cost savings and improved characteristics. The project will also use numerical simulation to improve impact resistance.

Title: Cyanide Destruction Technology Review
Company: The Royal Mint Ltd.
Technical Area: Advanced Materials
ASTUTE Academic Partner: Swansea University
Status: Completed
Duration: January 2013 - March 2013
Abstract: The objective of this project is to collaborate with the Engineering Projects Department of

the Royal Mint to study the alternative technologies and processes available for the safe, environmentally friendly and economically viable processing of cyanide based plating solutions.

Title: Lead Time Reduction

Company: Marco Gearing Ltd t/a Marco Cable Management

Technical Area: Other Technology - Manufacturing Systems

ASTUTE Academic Partner: Cardiff University

Status: Completed

Duration: September 2013 - May 2015

Abstract: The project is assisting the company with process improvement and standardisation and stabilisation of processes, supporting the acquisition of new manufacturing and material handling equipment.

Title: Design of Manufacturing Process and Supply Chain for New Laboratory Instrument

Company: Biotage GB Ltd.

Technical Area: Supply Chain Resilience

ASTUTE Academic Partner: Cardiff University

Status: Completed

Duration: December 2013 - August 2014

Abstract: This project was to assist with designing and testing the manufacturing process for production of new electronic instrument equipment and assistance with implementing supply chain using local suppliers.

Title: Controlling Wall Thickness of Injection Moulded Products

Company: Frontier Medical Products Ltd.

Technical Area: Medical

ASTUTE Academic Partner: Swansea University

Status: Completed

Duration: December 2012 - January 2014

Abstract: The aim of the project is to improve the consistency of the wall thickness of thin walled sections of an injection moulded product. The variation in wall thickness is currently being attributed to deflection of the inner core of the moulding tool, but it has also been hypothesised that temperature variations around the tool could also be a contributing factor. This project will seek to identify the cause of the thickness variation and propose solutions to overcoming its effect.

Title: Feasibility Study for the Development of a Processing System for High-performance Organic Transistors - OSC -OGI Matched Pair

Company: SmartKem Ltd.

Technical Area: Opto-Electronics

ASTUTE Academic Partner: Bangor University

Status: Completed

Duration: June 2012 - August 2012

Abstract: This project will investigate the feasibility of optimising the material processing methodologies for organic device performance.

Title: Research into Graphene Polymers and the Resulting Improvements in the Properties of Injection Moulded Components

Company: Frontier Medical Group Ltd. and Haydale Limited.

Technical Area: Medical

ASTUTE Academic Partner: Swansea University

Status: Completed

Duration: October 2014 - May 2015

Abstract: The possibility of producing materials with enhanced properties using graphene filled

polymers is investigated, with the aim of quantifying the effect on both the injection moulding process and the performance and properties of injection moulded components.

Title: Optimisation of Emulsion Production Parameters

Company: Cultech Ltd.

Technical Area: Other Technology

ASTUTE Academic Partner: Swansea University

Status: Completed

Duration: July 2011 - September 2012

Abstract: The purpose of this project is to understand and optimise the mixing process for food supplements. Numerical techniques will be used to determine the mixing parameters, which will be validated using results from an experimental investigation.

Title: Development of a Novel Bond Integrity Measurement Technology

Company: Acuity Products Ltd.

Technical Area: Advanced Materials

ASTUTE Academic Partner: Glyndŵr University

Status: Completed

Duration: March 2012 - July 2013

Abstract: Analysis of bonded CFRP samples by a novel ultrasonic technique to assess the ability of the technique to detect 'good' and 'bad' bonds.

Title: Primary Packaging Material

Company: Cultech Ltd.

Technical Area: Other Technology

ASTUTE Academic Partner: Swansea University

Status: Completed

Duration: July 2011 - March 2012

Abstract: The purpose of this project is to identify the performance of packing barriers/seals used for packaging of health food products.

Title: Corilla Plastics Factory Efficiency Improvement (Phase 1)

Company: Corilla Plastics (Bridgend) Ltd.

Technical Area: Advanced Materials, Thermal Analysis & Manufacturing Systems

ASTUTE Academic Partner: Cardiff University

Status: Completed

Duration: November 2013 - October 2014

Abstract: To investigate how different clamping systems could enhance process times. An investigation into new equipment for powder dispensation was also carried out as well as looking at Single Minute Exchange of Dies (SMED) techniques to improve mould changeover times.

Title: Assessment of Heat Exchanger Capabilities and potential for Energy Reuse

Company: Envases UK Ltd.

Technical Area: Other Technology

ASTUTE Academic Partner: Swansea University

Status: Completed

Duration: January 2011 - April 2011

Abstract: The objective is to study the energy usage at the plant to determine how the energy from the afterburner can be reused through a heat exchanger, within the factory environment.

Title: A Survey of Methods to Increase Operating Temperatures and Fire Resistivity in Engineering Applications

Company: Flamgard Engineering Ltd.

Technical Area: Advanced Materials

ASTUTE Academic Partner: Swansea University

Status: Completed

Duration: July 2011 - September 2011

Abstract: A scientific review will be undertaken on methods which increase operating temperature and fire resistivity in engineering applications (such as fire dampers, ventilation systems, structural building steels, turbine blades, aero-space structures etc.)

Title: Caravan Fuel Efficiency Improvement

Company: The Fifth Wheel Company Ltd.

Technical Area: Automotive

ASTUTE Academic Partner: Glyndŵr University

Status: Completed

Duration: February 2013 - May 2013

Abstract: Analysis of caravan design and recommendation for improvements.

Title: Computational Models and Small Scale Testing Rigs for the development of High Temperature Fire Damper Components

Company: Flamgard Engineering Ltd.

Technical Area: Advanced Materials

ASTUTE Academic Partner: Swansea University

Status: Completed

Duration: November 2012 - December 2013

Abstract: The objective of this project is to create and validate computational models which will be used for the development of fire dampers, which can operate at high temperatures in excess of 1000°C.

Title: Assessment of Added Value Processes

Company: Top Coat (Wales) Ltd.

Technical Area: Other Technology - Advanced Manufacturing

ASTUTE Academic Partner: Cardiff University

Status: Completed

Duration: March 2013 - June 2013

Abstract: The project aim was to identify suitable added value processes, equipment and advise on technical capability, acquisition, operational and maintenance costs.

Title: Automating Probe Calibration

Company: Aber Instruments

Technical Area: Other Technology - Software

ASTUTE Academic Partner: Aberystwyth University

Status: Completed

Duration: February 2012 - May 2012

Abstract: Aber Instruments manufacture probes requiring individual calibration using solutions of known salinity. This was a laborious process entailed a large amount of staff time. The project investigated how a computer could manage this calibration so staff need not do it by hand. The new process uses a rig in which probes are calibrated against liquids of differing degrees of salinity, delivery of these liquids and management of the calibration process being controlled by the project software.

Title: Water Jet Cutting

Company: Cottam and Brookes Engineering

Technical Area: Other Technology - Advanced Manufacturing

ASTUTE Academic Partner: Cardiff University

Status: Completed

Duration: September 2011 - April 2012

Abstract: The aim of the project was to investigate water jet cutting capabilities and compare with traditional subtractive manufacturing processes for use in a wide range of manufacturing processes.

Title: Hand Hygiene System

Company: Pulse Management Systems Ltd.

Technical Area: Medical

ASTUTE Academic Partner: Swansea University

Status: Completed

Duration: February 2011 - September 2012

Abstract: Feasibility study on issues relating to the potential integration of different sensing technologies and communication system architecture, and researching possible solutions to these for monitoring the hand hygiene compliance of hospital staff at the point of care.

Title: Business Model and Strategy Development for Dischromatics Ltd.

Company: Dischromatics Ltd.

Technical Area: Other Technology - Business Process Development

ASTUTE Academic Partner: Cardiff University

Status: Completed

Duration: September 2011 - March 2012

Abstract: The aim of the project was to help with the development of new business models and new corporate and business strategies for development and revenue growth. This was done via a rapid enterprise assessment, a business model session and a corporate strategy development session.

Website: www.dischromatics.co.uk

Title: Laser Machining of Phantoms for Testing of MRI Medical Software

Company: Acuitas Medical Ltd.

Technical Area: Other Technology - Advanced Manufacturing

ASTUTE Academic Partner: Cardiff University

Status: Completed

Duration: June 2013 - October 2013

Abstract: Acuitas Medical Ltd designs medical software and approached us to create a phantom test piece to test product capability.

Title: Printing Plant Remote Monitoring

Company: Cambrian Printers Ltd.

Technical Area: Other Technology – Software

ASTUTE Academic Partner: Aberystwyth University

Status: Completed

Duration: October 2013 - April 2014

Abstract: The proposed project was planned to provide timely information about the state of the company, including technical operational information and sales progress to company management. It would assist them in reducing downtime and reacting to machine breakdowns more quickly. This would enable the company to be more confident in scheduling throughput, and to increase competitiveness.

Title: Software Protocols for Secure USB Device

Company: MPWA Limited

Technical Area: Other Technology - Software

ASTUTE Academic Partner: Aberystwyth University

Status: Completed

Duration: June 2012 - July 2013

Abstract: MPWA Ltd devised a way of using a secure USB device to enable secure file transfer

between a remote server and any “guest” computer. The project investigated software protocols for logging in and initiating a secure file transfer session.

Title: Material Surface Activation

Company: Ortho Clinical Diagnostics

Technical Area: Advanced Materials

ASTUTE Academic Partner: Cardiff University

Status: Completed

Duration: November 2011 - June 2012

Abstract: This project was a follow on stage of Material Surface Activation 1 project and ASTUTE were tasked with engineering the surface activation requirements for a wide range of immunoassay products and ensuring that comparative performance was achieved to that witnessed in initial trials.

Title: TATA Resource Utilization and Supply Chain Transformation (TRUST)

Company: TATA Steel

Technical Area: Other Technology -Supply Chain Transformation / Supply Chain Management

ASTUTE Academic Partner: Cardiff University

Status: Completed

Duration: July 2013 - November 2014

Abstract: The aim of this project was to review and develop processes to drive forward the implementation of lean principles within the supply chains in the organization. We supported the on-going organizational re-engineering activities through the building of capability in supply chain excellence.

Title: Assessment of Technology for Acoustics Modelling

Company: Clearflow Energy Efficiency Limited

Technical Area: Other Technology

ASTUTE Academic Partner: Swansea University

Status: Completed

Duration: December 2011 - January 2012

Abstract: The objective of the scoping project is to explore simulation techniques for acoustics, to determine the potential for providing future assistance with the development of an acoustical waveguide for an industrial application.

Title: Plastic Sourcing Feasibility Study

Company: Ortho Clinical Diagnostics

Technical Area: Other Technology - Supply Chain Simplification

ASTUTE Academic Partner: Cardiff University

Status: Completed

Duration: January 2012 - July 2012

Abstract: The project’s aim was to carry out a feasibility study to investigate relocating the supply of polymer parts into the Welsh convergence area and developing local supply chain capability.

Title:

Company: Wall Colmonoy Ltd.

Technical Area: Advanced Materials

ASTUTE Academic Partner: Swansea University

Status: Completed

Duration: May 2012 - August 2012

Abstract:

Title: Quantification of Clay Coatings for Biodegradable Packaging

Company: Bob Simmons

Technical Area: Advanced Materials

ASTUTE Academic Partner: Swansea University

Status: Completed

Duration: July 2011 - March 2012

Abstract: The company is currently developing biodegradable packaging for the food industry. Many current biodegradable packaging substrates use barrier coatings which are not environmentally friendly. The company is looking to develop an environmentally friendly barrier coating for use on their substrate.

Title: CFD Investigation for Optimal Waveguide Design

Company: Clearflow Energy Efficiency Limited

Technical Area: Other Technology

ASTUTE Academic Partner: Swansea University

Status: Completed

Duration: June 2012 - March 2013

Abstract: Prior work has shown that the modelling capabilities within ASTUTE are sufficient to assist in the development of an acoustical device. The objective of this project is to research waveguides of varying cross-sectional diameters to minimise energy losses in the audible spectrum.

Title: Magnoheat Moldflow and Design Optimization

Company: Electronica Products Limited

Technical Area: Advanced Materials

ASTUTE Academic Partner: Swansea University

Status: Completed

Duration: April 2013 - June 2013

Abstract: The aim of the project is to ensure that all test moulded parts for the water heating system (Magnoheat) will mould properly using the prototype tools procured by Electronica. This will be achieved by firstly using Moldflow software to determine the feasibility of the moulding of these plastic parts. Gate locations and cavity arrangements will be studied for the individual Magnoheat components.

Title: Material Surface Characterisation

Company: Ortho Clinical Diagnostics

Technical Area: Advanced Materials

ASTUTE Academic Partner: Cardiff University

Status: Completed

Duration: October 2010 - October 2011

Abstract: This project investigated current and novel processes to modify material surfaces and characterise the performance of immunoassay wells.

Title: Feasibility of Knowledge Transfer in Injection Moulding

Company: Frontier Medical Products Ltd.

Technical Area: Medical

ASTUTE Academic Partner: Swansea University

Status: On-going

Duration: November 2014 - April 2015

Abstract: The current parameter settings for injection processing are based on the intuition of the experienced operators rather than a scientific method. The focus now is to establish where within the processing window their current processes are, with the potential for optimising the process and make sure they use all the capacity of their machinery. Possible anticipated improvements are lower energy usage, lower material usage, reduced cycle times, and an improved product quality, all of which can increase costs savings.

Title: "Strong as Steel" Medical Instruments

Company: DTR Medical Ltd.

Technical Area: Medical

ASTUTE Academic Partner: Swansea University & Cardiff University

Status: Completed

Duration: July 2011 - March 2012

Abstract: Project to investigate the manufacturing considerations within the company's product range. Through the project the use of alternative materials, which have comparable characteristics to the stainless steel used in existing devices, will be assessed.

Title: Application of Sensor Technologies for Accelerated Sport Training

Company: Fram3 Ltd.

Technical Area: Opto-Electronics

ASTUTE Academic Partner: Cardiff University

Status: Completed

Duration: April 2013 - March 2015

Abstract: The aim of the project is to help with the development of novel sporting equipment which can be used in the training of players. This will investigate suitable sensor technologies, development and testing of data collection systems and housing (to accommodate the components required) and development of software for signal processing.

Title: Designing Orangebox Remanufacturing Services

Company: Orangebox Ltd.

Technical Area: Other Technology - Product-Service Systems

ASTUTE Academic Partner: Cardiff Metropolitan University

Status: Completed

Duration: January 2015 - May 2015

Abstract: Orangebox and Cardiff Metropolitan University will use the structured service design and innovation methodology to conduct research with the network of key customers, staff, suppliers and stakeholders in order to map out the optimum service system.

Title: Experimental Validation of Results from Previous Computer Simulations of the Stresses of a Drum of a Washing Machine

Company: No Fast Horses Ltd.

Technical Area: Other Technology

ASTUTE Academic Partner: Swansea University

Status: Abandoned

Abstract: This was to focus on the challenging task of attaching sensitive strain gauges to the rotating drums of washing machines, in an attempt to measure the stresses and deformations occurring in the washing machine drum while it was actually rotating at high speed. This project was to be a pre-cursor to a larger ASTUTE project to undertake further simulations.

Title: Feasibility Study of Re grind Material

Company: Calsonic Kansei Europe Plc

Technical Area: Advanced Materials

ASTUTE Academic Partner: Swansea University

Status: Completed

Duration: November 2014 - May 2015

Abstract: The present feasibility study will investigate the efficiency of recycling waste from the car radiator manufacturing process, resulting in a more sustainable and environmentally friendly solution, at lower cost.

Car radiators are moulded from glass fibre filled thermoplastic. It has been observed that for specific mould design, the gating system takes up 20% of the total shot weight.

To recycle some of the waste, starting from a virgin material and the first moulding batch of radiator parts, waste is collected, reground and mixed with virgin material for the next batch. This process is then repeated, resulting in more and more reground material being introduced, as regrinding cycles add up. However, this will also lead to a deterioration of the mechanical properties of the radiator part.

The study will explore how many regrinding cycles could be performed before the mechanical properties deteriorate beyond an acceptable limit, when a completely new virgin material is introduced, and the whole process is repeated.

Title: Soup Quality Tracking

Company: The Welsh Soup Company

Technical Area: Other Technology - Software

ASTUTE Academic Partner: Aberystwyth University

Status: Completed

Duration: January 2014 - August 2014

Abstract: Welsh Soup Company had a requirement to be able to identify the traceability of ingredients in their soups. This was being done on paper and proved both laborious and difficult. The project explored the potential for automating this process through the use of tablet computers and a central database.

Title: Development of a Glass Washing Station

Company: Glass Tech Recycling Ltd.

Technical Area: Other Technology - Recycling

ASTUTE Academic Partner: Swansea University

Status: Completed

Duration: May 2013 - January 2014

Abstract: Glass Tech Recycling Ltd are looking to develop a system to clean glass received from council recycling streams. The objective of the project is to use modelling techniques to simulate the cleaning process, such that the final product can be used for higher value-added products than currently possible.

Title: Magnetic Loaded Polymer

Company: Heat, Light and Sound Ltd.

Technical Area: Advanced Materials

ASTUTE Academic Partner: Swansea University

Status: Completed

Duration: February 2011

Abstract: The work is to involve a feasibility study of the use of magnetic powders and different types of polymer to create a material for use in a new generator/motor.

Title: Investigation on the feasibility of optimizing the Grabener Press

Company: Schaeffler (UK) Ltd.

Technical Area: Other Technology - Production/Mechanical/Process Engineering - Bearing Manufacturing

ASTUTE Academic Partner: University of South Wales

Status: On-going

Abstract: This project conducted an investigation into the feasibility of ways in which the company could improve and develop a manufacturing system to increase product output in the production of bearing shells, improving product quality, lowering set up costs and reducing the scrap percentage. This also considered line balancing where possible to assist the flow of the product between work centres. Research into heat transfer across the tooling and product during the manufacturing cycle

was also undertaken during this project.

Title: Development of New Anti-tarnish Brass Coatings on Steel Substrates (Phase 1)

Company: The Royal Mint Ltd.

Technical Area: Advanced Materials

ASTUTE Academic Partner: Swansea University

Status: Completed

Duration: March 2013 - December 2013

Abstract: One of the aims of this work will be to develop Anti-Tarnish (AT) brass coins that do not tarnish or corrode for at least 10 years. This may be achieved through a chemical treatment, coating, parallel industry technology or alteration to the alloy and/or plating chemistry. This proposal represents the first phase of work and is aimed at defining a set of definitive tests for Brass tarnishing.

Title: Feasibility Study for the Development of a Processing System for High-performance Organic Transistors

Company: SmartKem Ltd.

Technical Area: Opto-Electronics

ASTUTE Academic Partner: Bangor University

Status: Completed

Duration: September 2012 - September 2013

Abstract: The project will assist the company in assessing the merits of several materials processing protocols for potential use in high performance organic transistors.

Title: Process Optimization and Control for TPR™ Manufacture

Company: Affresol Ltd.

Technical Area: Other Technology - Manufacturing Processes and Analysis

ASTUTE Academic Partner: Cardiff University

Status: Completed

Duration: October 2011 - July 2012

Abstract: The aim of this project was to review the current manufacturing process and to identify the top five areas for improvement in efficiency.

Title: Lean Initiation Study into Business and Process Overview for the Company

Company: Amcanu Ltd.

Technical Area: Other Technology -Production/Mechanical/Process Engineering - Sheetmetal Enclosures

ASTUTE Academic Partner: University of South Wales

Status: Completed

Duration: March 2011 - December 2013

Abstract: This project undertook a review of company operating procedures and processes and instigated a lean initiation exercise to review factory layout and processes to increase work flow, improve efficiency and productivity, alleviating capacity restrictions.

Title: Grind Characterization and Coffee Properties

Company: Coffee Punks Ltd.

Technical Area: Other Technology - Particle Analysis and Computational Modelling

ASTUTE Academic Partner: Cardiff University

Status: Completed

Duration: March 2012 - July 2012

Abstract: This project was to look at the grind characterization of new and used blades and the corresponding measured and modelled fluid flow properties during coffee making.

Title: Engine Mask – for GP 7000 High Pressure Turbine Rotor Forward Seal

Company: AIM MRO (GE Engine Services Ltd.)

Technical Area: Aerospace

ASTUTE Academic Partner: Cardiff Metropolitan University

Status: Completed

Duration: October 2012 - May 2013

Abstract: As part of the process during the maintenance of turbine engines AIM MRO are required to mask-off specific areas during grit blasting, plasma coating or post machining. Cardiff Met undertook a successful collaborative research project with AIM MRO to explore alternatives to manually masking-off one such that had a particularly complex geometry that could not be compromised in any way during maintenance. Trials of the final proposal gave better protection and reduced turbine service time.

Title: Ergonimbus Seat Proof of Concept

Company: Designed Innovation Ltd.

Technical Area: Other Technology - Engineering Development

ASTUTE Academic Partner: Cardiff University

Status: Completed

Duration: September 2012 - September 2014

Abstract: The aim of the project was to aid with the proof of concept of a novel Ergonimbus seat for the automotive industry. This included optimising the engineering performance using 3D modelling software and carrying out comprehensive testing simulations.

Title: Caravan Slide Out and Self-levelling Legs Development

Company: The Fifth Wheel Company Ltd.

Technical Area: Automotive

ASTUTE Academic Partner: Glyndŵr University

Status: Completed

Duration: February 2013 - May 2013

Abstract: Analysis of caravan design and recommendation for improvements.

Title: Plant Operations Dashboard

Company: Gomer Press Limited

Technical Area: Other Technology - Software

ASTUTE Academic Partner: Aberystwyth University

Status: Completed

Duration: January 2015 - April 2015

Abstract: Gomer have many machines operating, and wish to be able to keep track of their state easily at any time. Project to show that phone-based software can enable management to track state of plant at any time. Demonstration of the feasibility of using phone based software to track state of plant. Project will assist Gomer in deciding the usefulness of phone based software in reducing downtime and reacting to machine breakdowns more quickly. If positive, it is anticipated that following further development and investment by Gomer, the company will become more confident in scheduling throughput, and it will to increase competitiveness in the long term.

Title: Research into Cooling Capacity of Novel Radiant Panel

Company: Comyn Ching & Co (Solray) Ltd.

Technical Area: Other Technology - Computational Fluid Dynamics

ASTUTE Academic Partner: Swansea University

Status: Completed

Duration: March 2015 - May 2015

Abstract: Solray design and manufacture radiant heating and cooling panels. Solray have a concept design to increase the cooling capacity of their cooling panels. This project is to conduct research

into the cooling capacity of the concept design radiant panel using computational fluid dynamics to assess their effectiveness. This project will assist the company in determining if the concept is commercially viable.

Title: Computational Model of Rolls Behaviour

Company: Just Rollers Plc

Technical Area: Other Technology - Computational Modelling

ASTUTE Academic Partner: Swansea University

Status: Completed

Duration: March 2014 - October 2014

Abstract: Line trials can be both time consuming and expensive and often rely on the subjective views of the experienced roller technologist to define the correct configuration. A predictive behaviour model could not only help define the key parameters of the process it could also allow for performance optimisation to be realised much more quickly. A Joint project will be undertaken with ASTUTE in order to develop:

- An FEA-based computer simulation model that will allow very detailed analysis of roller configuration.
- A simpler spreadsheet type model that can be used as a guide to quickly estimate outputs for various different rollers and rubber coverings.

Title: Finite Element Investigation into New Magnetic Flux Leakage Inspection Tools

Company: Silverwing UK Ltd.

Technical Area: Other Technology - Electromagnetic Computer Modelling

ASTUTE Academic Partner: University of Wales Trinity Saint David

Status: Completed

Duration: June 2011 – May 2013

Abstract: The project involved undertaking FEA electromagnetic parametric studies to aid in optimizing new permanent magnetic geometries and provide simulated signals for magnetic field/defect interactions for evaluation and analysis. The study explored various magnetic circuit arrangements to determine optimum magnet arrangements to aid in near and far surface defect discrimination. A new product – Floormap3D was launched during 2013 which benefited from the optimisation studies undertaken.

Title: Fluid Catalytic Cracking Unit

Company: Ledwood Mechanical Engineering

Technical Area: Other Technology - Oil & Gas Industry

ASTUTE Academic Partner: Swansea University

Status: Completed

Duration: February 2014 - July 2014

Abstract: The aim of this collaboration will be to help Ledwood secure a contract for the manufacture of fluid catalytic cracking units.

The work will involve interrogation of CAD geometry to produce an animated sequence of the operations involved in the assembly of the various components. Further visualisation of the concept will be produced through 3D printed sections of the unit.

Title: Feasibility Study into Linear Bearing Product/Throughput Analysis

Company: Schaeffler (UK) Ltd

Technical Area: Other Technology - Production/Mechanical/Process Engineering - Bearing Manufacturing

ASTUTE Academic Partner: University of South Wales

Status: Completed

Duration: December 2012 - February 2014

Abstract: Carry out a feasibility study to investigate and analyse product flow and product constraints. Undertake lean initiation exercise on the manufacturing system and identify potential improvements on layout, supply and suitability of manufacturing equipment.

Title: Research into Fluid Flow in Manifolds.

Company: Atlantic Plastics Ltd.

Technical Area: Other Technology - High Value Manufacturing

ASTUTE Academic Partner: Swansea University

Status: Completed

Duration: February 2014 - October 2014

Abstract: This project follows on from a previous project with the company, the outcome of which was that the company designed a new manifold for their water meters, currently in the process of being patented. This project is to conduct research including CFD analysis and structural analyses of the stresses imparted by the flow within the manifold to assist the company to further develop it into a production system.

Title: Data Analysis Tools for Assay Immuno-Coating Manufacturing Processes

Company: Ortho Clinical Diagnostics

Technical Area: Medical

ASTUTE Academic Partner: Cardiff University

Status: Completed

Duration: December 2014 - April 2015

Abstract: This study will investigate how manufacturing parameters impact product performance and provide a clear understanding of the research and analysis that will need to be conducted to gain maximum benefit from this data. The project will determine the most appropriate data analysis methods and how they can be applied to addressing the challenge of analysing a large variety of manufacturing parameters that could impact product performance.

Title: Qioptiq Forecasting, Inventory Optimisation and Scenarios

Company: Qioptiq Ltd.

Technical Area: Other Technology - Supply Chain Transformation / Supply Chain Management

ASTUTE Academic Partner: Cardiff University

Status: Completed

Duration: December 2014 - April 2015

Abstract: The project aims to investigate product classification systems based on product demand, improved forecasting model(s) and to establish effective inventory control policies for their range of products.