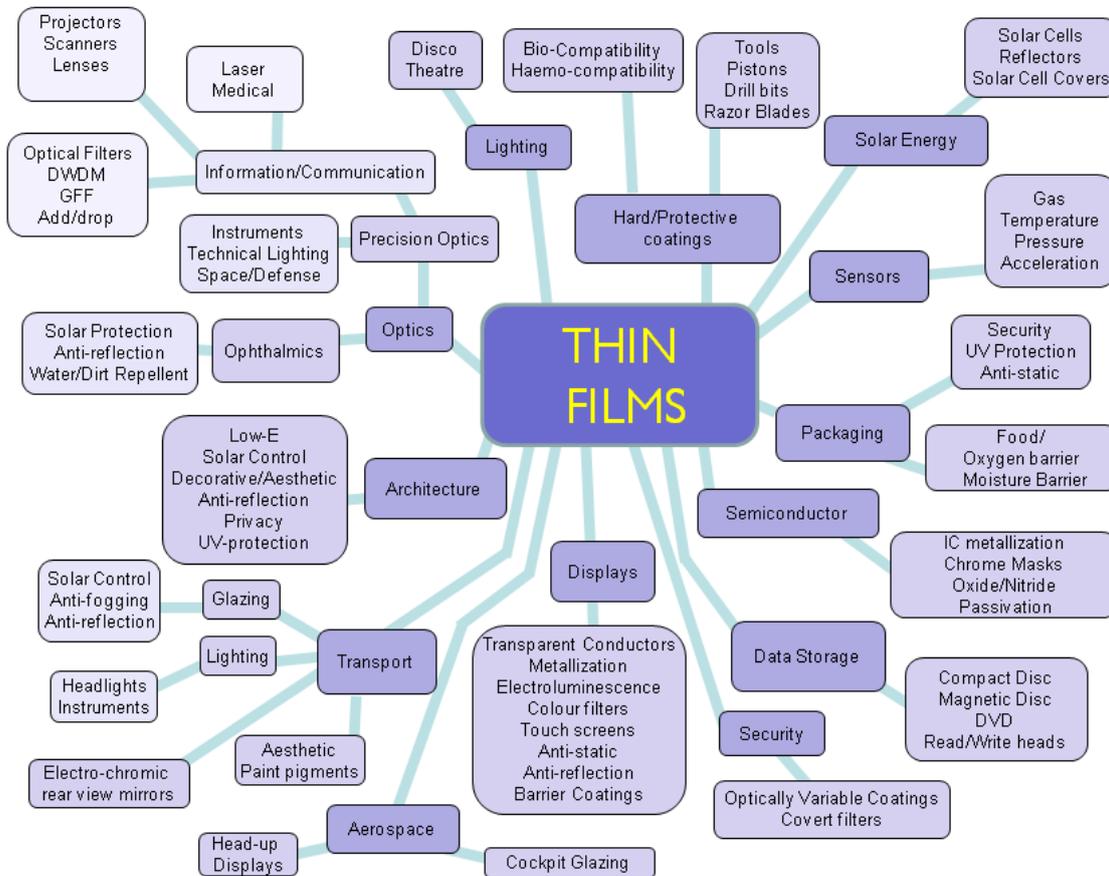


**Institution: University of the West of Scotland**

**Unit of Assessment: UoA13**

**a. Context**

The submitting unit of 8 staff from the Thin Film Centre and Microscale Sensors groups carries out research in the theory and applications of thin film coatings and sensors. First-class facilities for the deposition and characterisation of thin films and sensors are available, including two unique deposition systems operating at commercial-scales. The staff have backgrounds in physics, chemistry, engineering and life science covering a broad range of the applications (and theory) exemplified in the figure below. As such, the non-academic user groups interested in, benefitting from, and intimately involved in our research are industrialists from practically every one of the sectors shown below.



The main types of impact from our research arise from the generation of new and improved methods and processes, new materials, new equipment and new applications.

**b. Approach to impact**

In this unit, we have taken a very pro-active approach to ensure that potential users and collaborators are aware of how we can make a difference to their business, and the Thin Film Centre has enjoyed a particularly strong reputation within national and international companies for more than 13 years. Staff from this unit are regularly invited to give talks to technical staff within UK-based companies and to discuss problems and potential research-based solutions. Our expertise and facilities continue to be well publicised by the preparation and circulation of brochures to companies and by the active participation of staff in a variety of exhibitions. Within the 2008-13 period, we have taken stands at various annual Showcase-type exhibitions organised by bodies such as Scottish Enterprise (Glasgow, Edinburgh), the Scottish Optoelectronics Association

**Impact template (REF3a)**

(Edinburgh, Telford), SPE Offshore Europe (Aberdeen) and X-Mark Media (Photonex, Coventry). The annual SVC (Scientific Vacuum Coaters) conferences, held in various major cities across the USA, have proven to be very important for raising our profile with international companies, as these conferences are attended primarily by industrialists and users of thin film coatings, and the proceedings are published. Staff and PhD students from this unit have presented 11 research papers at SVC conferences in the 2008-13 period and we have also exhibited at one of the accompanying exhibitions with a local company (Scalar Technologies Ltd), where we demonstrated a broadband optical monitoring approach from a KTP project.

Direct contact with companies is made through the university's very active Innovation and Research Office, which is a founder member of Ceed (Centre for Engineering Education and Development), a very successful community of 125 universities and businesses with a base in Scotland ([www.Ceed-Scotland.com](http://www.Ceed-Scotland.com)). Staff from this unit have hosted Ceed member events and given themed talks to subgroups. In addition, many companies have contacted us directly through our website ([www.thinfilmcentre.co.uk](http://www.thinfilmcentre.co.uk)).

As a direct result of these promotional efforts, we have obtained funding for a significant number of knowledge exchange schemes and R&D. Funding for smaller short-term projects has been obtained through various government schemes and KTNs and within the 2008 to 2013 period we have engaged with companies in small projects funded through Carnegie Trust (3), Interface ([www.interface-online.org.uk](http://www.interface-online.org.uk)) (2), SUPA (2), TTOM (1), SCoRE (1) and Scottish Sensor Systems Centre (2).

Longer term projects that we have led within 2008-13 include KTP projects (2), iCASE PhD studentships (5), funded through EPSRC with partners QinetiQ, DSTL, Polaroid UK, Thin Film Solutions and SST Sensing, and an ITI funded project with Sub-One Inc. Staff in this unit also led 2 SEEKIT (Scottish Executive Expertise, Knowledge and Innovation Transfer) programmes, obtaining funding of close to £1 million, each spanning a four year period and leading to involvement with over 100 SMEs (confirmation of these claims in final reports for SEEKIT in Thin Films and SEEKIT Inspired).

Staff are supported by the university for knowledge exchange and research activities through appropriate reductions in administrative and teaching duties, through funding for equipment and through internal studentships.

**c. Strategy and plans**

The strategy for the future will evolve along the same successful lines. We are partners in the recently announced CENSIS (Centre for Sensors and Imaging Systems) innovation centre, funded by SFC and Scottish Enterprise, which aims to be industry led and to develop industry/university collaborations. We will also develop collaborations through the CPI HMV Catapult centre at Sedgefield, where there is a strong synergy through our own work on plastic electronics. We have also identified marine energy systems as a very important sector which, although at the prototype stage at the moment, will be a strong market for our corrosion resistant coatings and the development of anti-fouling coatings.

**d. Relationship to case studies**

Our expertise in low temperature coatings and the capability of coating large area substrates with low defects and high reproducibility has opened up many exciting opportunities. Plastic electronics was identified as a very promising area for the UK in 2002 and we have had a long term relationship with the world leading supplier of polymer film, Dupont Teijin Films Ltd, since then, and with the world leading innovator in plastic electronics, Plastic Logic Ltd, since 2004. These collaborations resulted in two major research grants and the demonstration of the first ever all-polymer flexible display. A third collaborative grant to these partners that led to demonstration of the first A4 size flexible display was awarded by EPSRC/DTI for the period 2007-2010 (reference Case Study 3b).

Initial funding from the Scottish Optoelectronics Associations TTOM programme led to a long term relationship with a local company, Thin Film Solutions Ltd, which continues with one of the iCASE studentships, and the impact from this research is the subject of our second case study in 3b.