

Impact Outlook

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- ‘Engineering in general needs to create more inclusive cultures that inspire, attract, recruit and retain more women, ethnic minorities, disabled, older and younger people from all socioeconomic backgrounds’

The precise way forward

David Billington provides an overview of the historical trajectory, current initiatives and future directions of the European Society for Precision Engineering & Nanotechnology, of which he is Executive Director

Could you start by introducing the mission and activities that underpin the European Society for Precision Engineering & Nanotechnology (euspen)?

euspen has been actively pioneering advancements in precision engineering and nanotechnology since 1999. Its roots were planted when a group of leading European industrialists and academics came together with a shared desire to establish a networking forum for the already important precision engineering and nanotechnology community. Their aim was to establish a body that worked alongside and complemented societies in the USA and Japan that were already working in the sector. Today, euspen is recognised across the precision engineering and nanotechnology sector as a highly creative and respected body.

The euspen board appreciates that the Society must continually adapt, evolve and grow its reach in order to fulfil its explicit networking and information exchange mission: to provide an entrepreneurial platform that enables companies and research institutes to promote their latest technology developments, products and services and keep up to date with developments in the field. In this way we can fulfil our core aims which are to advance the arts, sciences and technology of precision engineering, micro engineering and nanotechnology; to promote their dissemination through education and training; and to facilitate their exploitation by science and industry.

What key technologies do you think will emerge from the fields of precision engineering and nanotechnology in the upcoming years?

We feel that a key area that will see a burgeoning number of micro applications will be the Internet of Things – the sky really is the limit in this area. We will soon wonder how we managed to live without a fridge that tells us when we need to buy groceries or a shirt that tells us when it needs to be washed!

In key sectors such as medical, aerospace and automotive, micro manufacturing is being used more and more in safety critical applications, and original equipment manufacturers (OEMs) are demanding increasingly precise parts in an array of different (and often difficult to process) materials. We will therefore see a growing number of metal and plastic fabrication processes that are able to achieve more and more exacting tolerances, and with better and better repeatability. However, hand in hand with this is the ability to measure and assess the functionality and achievement of design intent, and this means a continued focus on increasingly sophisticated metrology technologies. The saying in the micro and nano sector is that you can't make it if you can't measure it, so manufacturing technologies work in tandem with metrology solutions to push boundaries and stimulate innovation in the field.

Finally, we need to mention additive manufacturing, a disruptive technology across pretty much all industry sectors these days that is moving to becoming a true manufacturing technology. In the area of precision engineering, dimensional accuracy and surface finish in additive manufacturing is crucial to putting it onto the factory floor, and precision metrology techniques are crucial to mapping a way forward with this rapidly developing sector.

The Society has a certified precision engineering course. What problem is this designed to solve, and how?

One of the objectives of euspen is to improve the level of knowledge and cooperation in the field of precision engineering within Europe. The euspen certified precision engineering course program (ECP²) has been developed to meet the demands in the market for continuous professional development (CPD) and training of post-academic engineers working within the fields of precision engineering and nanotechnology. The general aim of ECP² is to support CPD in precision engineering in a European perspective, offering high-quality

David Billington has over 15 years' experience at executive board level and has spent the last four years working at **euspen**. He is experienced at leading businesses to revenue and profit by transforming business processes and manufacturing operations and by driving targeted sales and business development initiatives. His experience covers P&L management, risk and change management, cost reduction, strategic planning, product and business development, production, operations, distribution, staffing, and sales and marketing. He is highly analytical, numerate and literate, and has excellent planning, organisational, team and stakeholder management abilities as well as strong technical skills.

learning opportunities to individuals for specialised competences in order to strengthen employability and personal development in strategic European advanced manufacturing industries.

ECP² consists of a range of short courses aimed at degree-qualified precision engineers with work experience. Each course is graded and allocated a point's score according to its difficulty and topic relevance, with points being awarded to the scholar upon the successful completion of each course. Once a predefined number of points have been reached across a mix of subject topics, the scholar is awarded a certificate that is recognised throughout Europe and the scholar's details are entered onto a centralised European register. The intention is to provide a structured approach to CPD within precision engineering and provide qualified engineers with an industry-recognised qualification which will promote greater transnational portability of their skillset within Europe.

Is the Society taking any particular actions to encourage engineers from underrepresented groups, such as women, to enrol in ECP² and its other initiatives?

We are trying to make all our activities — including the ECP² initiative — as inclusive as possible, and we seem to be relatively successful in attracting women to our events and platforms. For example, about 35 per cent of the attendees at our annual conference and exhibition last year were women. The underlying issues here are deep rooted, and **euspen**'s role is to lobby and influence where appropriate for a general increase in the number of women working in the area of science, technology, engineering and mathematics. Across Europe, it is estimated that only 8 per cent of engineering professionals are women, and many of these are working in non-senior positions. At all levels, the emphasis must be on engagement and outreach work, and encouraging and promoting the education, study and application of engineering through events and initiatives aimed specifically at women in schools and student groups.

It is difficult to pinpoint one initiative in particular that **euspen** undertakes to promote diversity, as at our core is the advancement of the precision engineering and nanotechnology sector in the round, and in a totally inclusive way. As a society working in this sector, it is down to us to bring together stakeholders to attempt to stimulate action that will develop a diverse and inclusive profession that inspires, attracts and retains people from different backgrounds, and reflects Europe's increasingly diverse society. Engineering in

general needs to create more inclusive cultures that inspire, attract, recruit and retain more women, ethnic minorities, disabled, older and younger people from all socioeconomic backgrounds into engineering employment and professional engineering institutions.

This year, the Society hosted its 18th International Conference & Exhibition. Would you like to highlight the programme of events and speakers?

Our flagship annual event was held in Venice, Italy, on 4-8 June 2018. It provided an extraordinary forum for industrialists, R&D professionals and academics to review the best worldwide industrial innovation, progressive research and technology developments in the micro and nano manufacturing sector. In addition to an international conference, workshops and tutorials, the event also boasted one of the world's largest exhibitions of key players in the provision of technology solutions for the precision engineering and nanotechnology sector. Over the five days of the event, attendees were able to access numerous papers discussing issues of precise interest to the burgeoning and exacting area of precision engineering. This year's annual event was the biggest we have ever organised, and we would invite anyone interested in attending next year's to keep an eye on our events page so that they can register as soon as possible to avoid disappointment. You can find out more at: <https://www.euspen.eu/events/>.

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