

MARK MELLORS

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My background is in manufacturing, working in both high speed food packaging manufacturing and the highly regulated aerospace industry. My more recent experience is in new product development: concept creation for engineering consultancies and technical lead taking the products through to manufacture. My mixture of analytical skills and practical knowledge allow me to manage technical risk and generate creative solutions. I'm the named inventor on a number of fluid handling and chocolate related patents.

Freelance Mechanical Engineer/Director at Mechanically Minded , 2013 – Present

Technical lead, documentation, verification, validation, R&D, prototyping, innovation

Working with small to large manufacturing and services companies to develop their business and products, from an hour here and there up to long term, on-site contracts. Products include tools for robotic and ophthalmic (eye) surgery, dentist cleaning tools, pharmaceutical checkweigher, inhalers, firefighter breathing equipment, industrial gas valves and robotics in entertainment, agriculture and home cleaning.

Manufacturing Engineering Consultant at Field Ready, 2014 – 2017

Engineering, prototyping, manufacturing, field work (Haiti, Nepal), innovation, R&D

Field Ready provide humanitarian assistance and disaster relief in new ways using the latest technology. Their vision is to meet humanitarian need by transforming logistics through technology, innovative design and engaging people in new ways. I led local teams to develop life-saving designs that could be safely manufactured with appropriate technology either through repurposing existing capacities or using portable equipment. An example is search and rescue heavy lifting airbags made in Syria with basic tools and locally available materials that met international safety standards. I created design and engineering processes suitable for the unique organization, and trained staff on their use. I led design reviews and made significant contributions to the 3D designs catalogue.

Mechanical Engineer at 42 Technology Ltd , 2008 – 2012

Business development, project management, facilities management, technical leadership, R&D, innovation.

42 Technology is an engineering consultancy that solves difficult technical problems and creates innovative ideas for new products and processes for a wide range of clients and markets. I was involved in business development, project management and managed their labs and workshops, but mainly my role was technical lead on projects which involves either the hands on doing or leading a team to: analyse problems, create design concepts, develop and assess concepts, create and test appropriate models, develop and review technical production drawings, work with partners and manufacturers, design and production failure modes and effects analysis, tolerance analysis and IP protection.

The work at 42 Technology used a lot of my skills: modelling, mechanics, creativity, software, electronics, coaching, prototyping, fluids, structures, materials, manufacturing. Projects included: coffee brewer, surgical tools, beer dispense, disposable TB diagnostics, concentrated solar farm, dry powder inhaler, chocolate processing.

Design Engineer/Manufacturing Engineer at GKN Aerospace, 2006 – 2008

R&D, design, transfer to manufacture, Lean manufacturing, process automation, management

GKN Aerospace, Luton, design, test and manufacture composite heater elements for aircraft. I joined just as the Ice Protection System design for Boeing 787's was being transferred to manufacture. I developed the manufacturing methodologies to repeatably manufacture the components faster, to a higher standard and with less experienced labour, using lean methodologies, process automation and process control. I trained new technicians, created an automated thermographic inspection station and wrote production Standard Operating Procedures.

Design Engineer at Carbon Concepts, 2004 – 2005

R&D, testing, prototype manufacture, composites

Engineering Sponsored Student at Crown Cork & Seal, 2000 – 2002

High volume manufacturing, manufacturing engineering, maintenance systems.

EDUCATION

2001 – 2005 Pembroke College, Cambridge University (BA and MEng in Mechanical Engineering)

2000 Colchester Institute: Sept - Dec

Level 2 Foundation NVQ Engineering Manufacture (under sponsorship by Crown Cork & Seal)

SKILLS AND OTHER INTERESTS

Product Development

Full life cycle of concept to manufacture

- Innovation processes, including TRIZ
- De-risking by analytical modelling, proof-of-principle and scientific testing
- Design for manufacture, including tolerance analysis and DFMEA

Software Packages

- 3D modelling: Solidworks, Fusion 360, OnShape
- Programming languages: Python, Visual Basic, C++

Practical Skills

- Machining: lathe, mill (CNC & manual)
- Welding: MIG & TIG
- Common machine shop tools (bandsaw, brake, press etc)
- PCB design, assembly and debugging

Interests

- Founder member of a community workshop (<http://hitchin.hackspace.org.uk/>)
- 3D printing and robotics
- Prolific maker (portfolio on JellyandMarshmallows.co.uk)
- Climbing and running