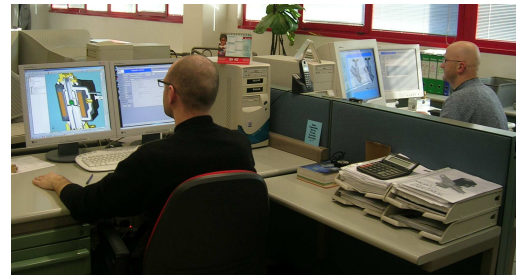


## M&M International - Engineering Capability

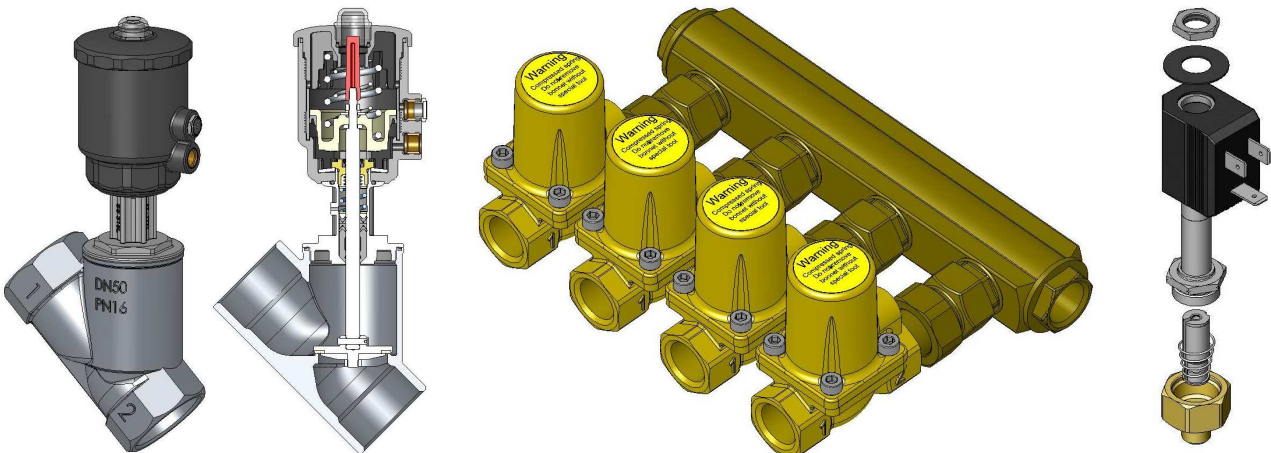
M&M International understands that for a company to progress it must continue to invest in the latest technology to support its product base and ongoing development plans. The company's technical department specialises in developing both new products and customised solutions for its customers using the latest tools and techniques. Our current capability



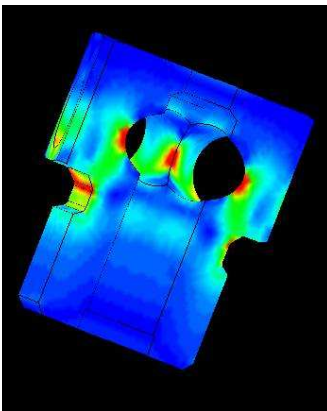
includes a Solid Works 3D CAD system as well as access to FEA (Finite Element Analysis) and CFD (Computational Fluid Dynamics). M&M also has a fully equipped UL qualified laboratory to undertake product testing to international standards. Access to the latest software, techniques and processes backed up by our in house experience allows us to develop solutions quickly and efficiently to meet the needs of our customers. The Solid Works 3 D CAD System enables us to generate working



models and the necessary drawings and files to support a modern manufacturing facility and to supply customers with improved visibility and detailed information on both standard and customised products.



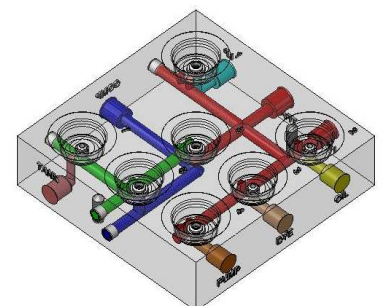
**Finite Element Analysis** is a computer simulation technique, the software constructs a finite element mesh of the structure utilising a CAD model. The model is then loaded with applied



mechanical and thermal forces and parameters to replicate service or test conditions. Often only small changes to component design can reduce design stresses and therefore significantly improve product life. The software is also useful for ensuring wall thickness are optimised eliminating waste material and cost and modelling thermal radiation helping to ensure the product is able to meet required performance criteria.



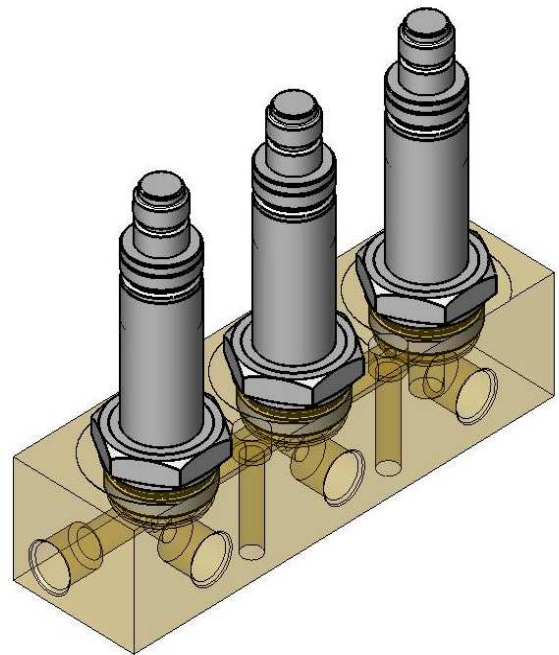
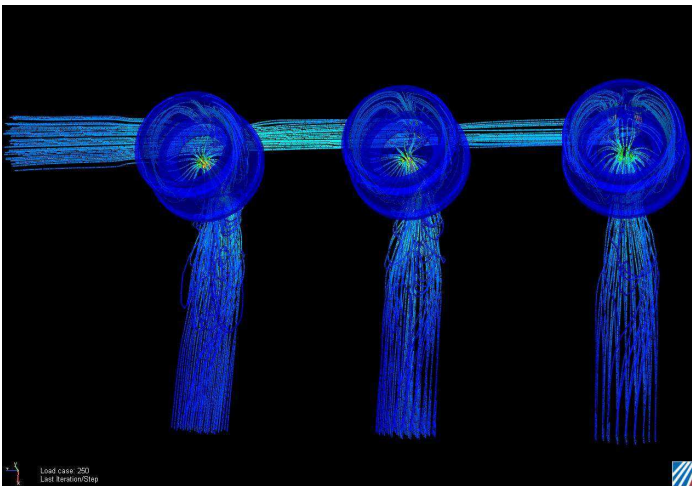
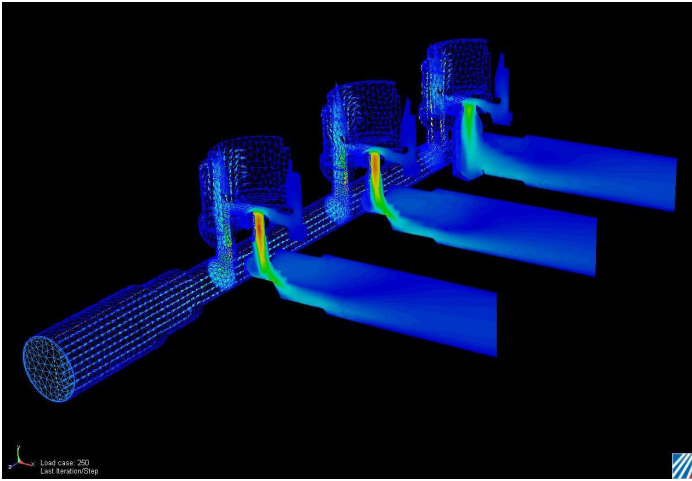
**Computational Fluid Dynamics** is an analysis tool that uses numerical methods and algorithms to solve and analyse fluid flow problems. Utilising a 3D CAD model the software performs millions of calculations to simulate the interaction of fluid and gases with the complex surface generated. The software can be used to model and measure fluid velocity and pressure through the product as well as modelling flow paths using particle tracing to help ensure the



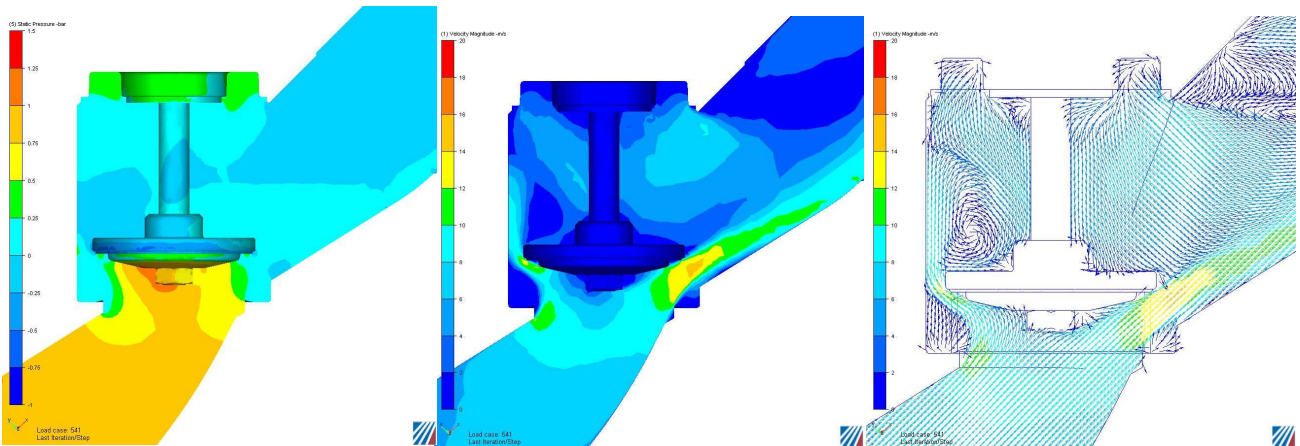
optimum design is produced.

A recent example of the benefits of the software involved optimising the flow capacity of a standard three position manifold. The customer was experiencing problems with pressure drop and flow reduction through a competitors product and needed to improve the manifolds performance. Rather than manufacturing samples every time a design modification was made

the software was able to analyse the CAD models and determine the flow rate through the product and highlight areas of flow restriction and turbulence utilising both particle tracing and fluid velocity analysis. Subtle modifications to the design of the flow path produced the necessary performance improvement quickly and effectively.



The images below show the flow path through a Piston Actuated Valve. The first image shows pressure drop through the valve, the second fluid velocity, which highlights flow restrictions and the final image velocity magnitude, which highlights turbulent areas, or areas where recirculation occurs.



We aim to be your preferred partner for all solenoid and piston actuated valve solutions. Please contact us, as we are confident that our experience and technical capability will enable us to meet all your requirements.