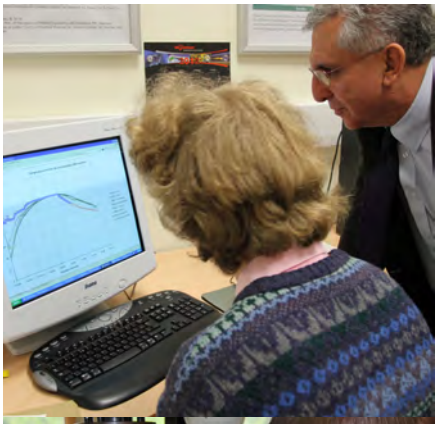

Rubber in Engineering

Rubber Consultants has expertise in rubber engineering components ranging from small automotive mounts and bushes through anti-seismic devices to large marine fenders. Rubber Consultants' engineers are not only experts in the principles of design of elastomeric engineering components, but also in general engineering functions such as shock, noise and vibration control. Main areas covered include:

Expert advice

Drawing on 75 years of experience in research and application of elastomers, embodied in a set of over 1800 technical publications, experts are available for consultation on most aspects of the use of rubbers for engineering applications. Although our speciality is in rubber, we have a good working knowledge of design with other materials and of applications in structural, civil and mechanical branches of engineering.

Finite Element Analysis (FEA)

Rubber Consultants have MSC.MARC and ABAQUS, and a wide experience of applying these non-linear Finite Element Packages to stress analysis, fatigue life prediction, load-deformation behaviour, dynamic applications in vibration control and heat transfer problems.

Research Projects

Rubber Consultants engineering staff have led and worked on many large research projects involving engineering applications of rubber and elastomers and published many technical papers. Topics include seismic isolation, shock and vibration isolation, constitutive models for rubber, friction of rubber, fatigue and lifetime prediction, marine fenders, and bridge bearings. (For list see www.rubber.demon.co.uk)

Design

The main thrust of the engineering research programme is to develop the design principles for rubber engineering components. This is as much to define characteristics needed to meet the engineering function as to design elastomeric components that meet these characteristics. In addition, we have expertise in design of test jigs, tooling for rubber components and connection fixtures for rubber components within engineering structures. All this experience is available for specific design problems.

Test facilities

We have a comprehensive set of mechanical test equipment for engineering components, suitable for both component tests (up to 2500kN dynamic) and material characterisation tests, including environmental chambers and an ozone room. Specialist material test facilities cover thermal conductivity, friction over a wide range of normal stresses, crack-growth characteristics and fatigue flaw size estimation. Advice can be provided on choice of test, for example for characterising the stress-strain behaviour of materials for simulation in Finite Element Analysis.

Supply of rubber components

Design and supply can be arranged of elastomeric engineering components, from earthquake isolation bearings to minature vibration isolators. Manufacture of smaller components and prototypes is possible in-house; for larger-scale production, appropriate manufacturers can be sourced.

Training

We offer tailormade training courses in engineering with rubber, with flexibility on content and timing.

Our expertise also covers :

- Assessing elastomer property requirements:
  - environmental
  - high and low temperatures
  - water and oil reistance
  - ozone resistance
  - strength and fatigue; crack growth
  - dynamic modulus and damping
  - creep, stress relaxation and hysteresis
  - friction and abrasion
- Rubber bonding
- Product design and performance verification using SolidWorks and Mathcad
- Manufacturability assessment using Moldflow
- Mould design and prototype testing
- Choice of elastomer and compounding
- Manufacturing technology
- Product specifications and standards

Rubber Consultants

TESTING • INNOVATION • SOLUTIONS

since 1984

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