

Surrey Satellite Technology Ltd; Spin in of COTS Visco-Elastic Materials and Elements into Space Applications

Project Summary

Visco-elastic materials, typically different types of rubbers, are a well-established technology to attenuate vibrations. SSTL regularly uses visco-elastic materials and elements on their spacecraft for the purpose of vibration, microvibration and shock isolation systems. Currently, supply is relying on a single foreign supplier and new developments would be costly and time consuming. The cost to supply existing isolation elements is prohibitive to use on the lowest cost small missions SSTL offers. Reducing the cost will allow SSTL to offer smaller low cost platforms providing better imagery. SSTL have identified Stop-choc as an excellent candidate to be a UK supplier which meets these requirements.

Stop-choc design and manufacture anti vibration mounts, vibration isolation products & vibration isolators, shock mounts and shock isolation systems. Stop-choc provide anti vibration mount solutions using the latest technology in highly damped materials reducing amplification at resonance and providing excellent durability in severe environments which are used in various industries, such as the aerospace industry. However, Stop-choc has not previously applied their knowledge to a space application.

The main purpose of this project is to establish a new industrial research collaboration between Stop-choc and SSTL to spin in Stop-choc's technology. This will be done by assessing the suitability of existing Stop-choc technology for space applications. It is anticipated that integrating Stop-choc components will also constitute a considerable cost saving for future SSTL missions. They could reduce the recurring cost of an isolation system by an order of magnitude.

The chosen project to trial Stop-choc technology is a vibration and microvibration isolation mount for a reaction wheel. This project would look at spinning in an existing Stop-choc visco-elastic element to replace the heritage European component, with the aim of achieving equal performance for significantly less money. To demonstrate this, the engineering unit of an existing isolation mount will be re-worked to allow a low-cost validation campaign. Crucial tests to verify compatibility with the space environment include outgassing testing, functional, microvibration and vibration tests. These will be performed to assess the suitability of the Stop-choc technology.