



Case Study

About: Reaction Engines LTD

Reaction Engines Ltd ('REL') is located in the United Kingdom and was formed in 1989 to develop the technologies needed for an advanced combined cycle air-breathing rocket engine class called SABRE that will enable aircraft to operate at speeds of up to five times the speed of sound or fly directly into Earth orbit.

Reaction Engines achieved a breakthrough in aerospace engine technology by developing ultra-lightweight heat exchangers 100 times lighter than existing technologies that allow the cooling of very hot airstreams from over 1,000 °C to minus 150 °C in less than 1/100th of a second.

Reaction Engines' technology has undergone extensive independent technical assessments, undertaken by the European Space Agency at the request of the UK Government, which have confirmed the viability of the engine technology and its vehicle applications.

www.reactionengines.co.uk



REACTION ENGINES

Client: Reaction Engines LTD

Need: Preliminary compressor design for SABRE engine project

Solution: AxSTREAM™ and custom loss model implementation

AxSTREAM™ Used in Preliminary Design of SABRE Compressor

Reaction Engines' SABRE engine is at the forefront of next-generation aviation innovation. Design of the SABRE engine requires specific considerations given the inherent technological challenges. As part of this design, Reaction Engines LTD collaborated with SoftInWay Inc. and completed work on preliminary compressor design for the SABRE's transonic compressors.

Reaction Engines used SoftInWay's AxSTREAM™ software as their design tool of choice. SoftInWay also provided continuous technical support and training throughout the duration of the design project. As a result the SoftInWay engineering team was able to quickly develop and implement a custom loss model meeting the compressor design criteria required by Reaction Engines for the SABRE synergetic air-breathing rocket engine.

"The SABRE engine requires a highly efficient and low mass compressor. We have decided to use the AxSTREAM™ tool for our compressor design because it has an easy to use interface and integrated design suite, which has allowed quick assessment of the design space." said Philippa Davies, Performance Engineer at Reaction Engines Ltd. In addition, the SoftInWay technical team have incorporated and advised us on a custom loss model for our needs. We provided SoftInWay with academic papers on the loss model we required, and this was incorporated very quickly following the decision to buy this software. Since then, the Technical Support team have been extremely responsive in answering technical questions and providing their opinions to assist us with our compressor design."