



R&D Tax Credit Case Study: Formula 1 cooling system relief valve

Companies involved in motorsport are often dissuaded from making R&D Tax Credit claims because they are unclear as to what type of development work might qualify. Whilst complex, total system, developments are likely to qualify, individual component-level developments may also qualify. The following example highlights a successful claim made by a valve engineering specialist for a cooling system relief valve used in Formula 1 (F1), and which resulted in an R&D tax refund for the company.

The R&D project

The valve specialist was approached to establish if it could develop an improved corrosion-resistant relief valve used in the engine cooling system of F1 race cars. The present anodised aluminium design of valve was subject to corrosion attack from the chemicals used in the cooling system fluid resulting in leakage issues and reduced valve life. The new relief valve would have to be capable of being retrofitted into the current F1 car design, without the need for modification of the cooling system, or any other changes to the car or engine. At the same time the new valve needed to weigh the same, or less, as the existing valve.

Development undertaken

The valve specialist analysed the valve's operating environment and how it functions including confirming the performance specification. In parallel the company set out to understand the corrosion issues with the current aluminium valve. Due to F1 confidentiality issues the full specification of the cooling system fluid could not be released to enable full analysis of the chemicals that might be causing corrosion. The valve specialist relied on its experience and knowledge to define a suitable replacement material. An analysis of potential materials was undertaken and stainless steel was selected as the most probable material that would enable the performance, reliability and anti-corrosion requirements to be addressed. However stainless steel is heavier than aluminium requiring the development of a new reduced-sized valve.

The valve specialist undertook a design and value engineering exercise. To reduce weight the new design was more compact than the existing type, and the integration of a feature to mate with the next component on the car enabled one part to be eliminated saving further weight. The net effect was an overall weight saving. Following successful development and testing, approval was sought from the FIA for the new valve to be released for use in F1 competition.

R&D Tax Credit claim

R&D Tax Specialists was engaged by the valve specialist to develop an R&D Tax Credit claim for their development work. Following an internal benchmarking exercise to confirm which projects would most likely meet the HMRC criteria for R&D Tax Credits, a claim was prepared for the cooling system relief valve.

Following a technical review with the valve specialist, the necessary claim submission documentation and financial analysis was developed by R&D Tax Specialists. The value of the claim was based on internal time spent on the development work by the company's management and engineers, together with prototype materials consumed, and a proportion of utility costs for the company's premises.

After approval from the valve specialist, the R&D Tax Credit claim was submitted to HMRC and was subsequently agreed. The valve specialist received a full tax refund a few weeks from submission which the company used to invest in further development activity.