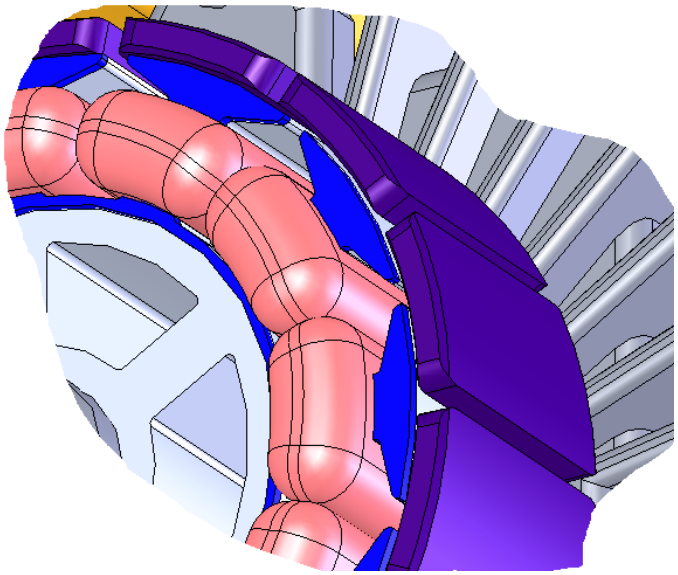
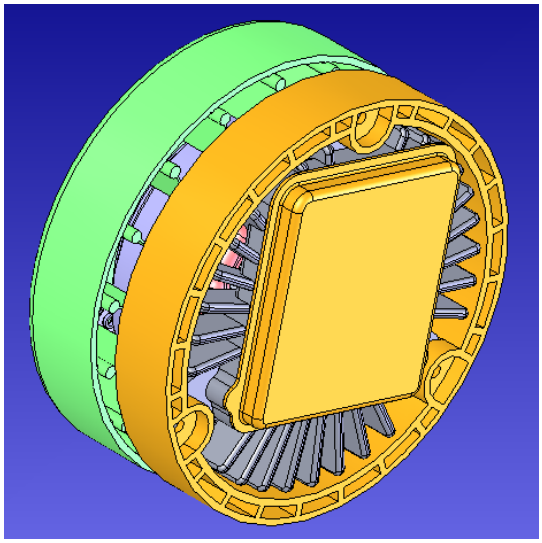
Intelligent Fluid Solutions
Experts in Fluids Engineering

Electric Motor Internal Thermal Analysis

A compact high-power DC motor generates significant internal heat causing the primary components to exceed 100 ^{0}C in temperature. Under normal ambient temperatures this is satisfactory, however in extreme desert conditions premature failure of the motor occurs due to over-heating.



Optimisation of the motor with a unique internal cooling fan was necessary in order to permit the motor to operate continuously in high ambient temperature conditions. A cost-effective design tool was required to carry out rapid system analysis on the design.



Empirical analysis was carried out modelling component temperatures, fan airflow rate, and convective cooling. An Excel spreadsheet model was generated with key geometric features of the design to determine the design performance under given conditions.

The spreadsheet-based model offered cost-effective and time-efficient turn around of design analysis suitable for in-house client use. It also provided a mechanism for optimisation of the motor-fan system.

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