

# Optimum Fin and Cold Plate Height Immersed in Server

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## Abstract

### Introduction

High performance data centre is required to cope with high demand in the IT applications. As the power is turned to heat load and more power means more heat load. Hence, cooling data centre is one of the major aspects that must be considered to keep the data centre working without failure. There are two main methods that are used to cool data centre, air and liquid cooling techniques. This study is carried out by using liquid cooling because it performs better than air cooling technique. The system in this study is closed server where the server is filled with Novac dielectric liquid. The heat is generated by the CPU then the heat conducts to the fin which helps to dissipate the heat. The heat convects via the dielectric liquid to the cold plate 'cold lid', where the cold plate is placed on the opposite side. The liquid moving is due to the liquid density variations between hot fin and cold plate.

### Use of COMSOL Multiphysics®

The aim of this study is to find out the optimum value of the fin height and the cold plate height. The model set up is validated with published experiment. A 3D model of COMSOL Multiphysics® is used to find that the optimum fin height is 6 mm and the cold plate height 'cold lid' is 30mm. These are initial results.