



## Reduce 33% Cycle Time through CAE Evaluation Method of Conformal Cooling System



鑫銓股份有限公司  
ZING CHUAN CO.,LTD

Customer: [Zing Chuan Industry Co., Ltd](#)  
Country: Taiwan  
Industry: Mold Making  
Solution: [Moldex3D eDesign](#)

Zing Chuan was established in 1986. From tooling design and manufacturing, serial injection part product and component assembly, all of them could be finished according to client's request. (Source: <https://www.zingchuan.com.tw/en/index-2/>)

### Executive Summary

The USB storage device shell casing has an inside section with a conformation where accumulated heat is not easy to be conducted. A significantly large temperature difference between the interior and exterior areas of the product will cause warpage. In order to increase production yield, an effective but expensive conformal cooling system is required. Moldex3D helped Zing Chuan design a suitable conformal cooling system before building the real mold so that the production risk and cost can be reduced. Based on the analysis, the new conformal cooling system is able to dissipate the accumulated heat efficiently. As a result, cooling time is successfully shortened, and product deformation has been corrected.

### Challenges

- Large product deformation due to the interior accumulated heat
- Uncertainty of the effect of developing a new conformal cooling system



Image Courtesy of Zing Chuan Industry Co., Ltd

## Solutions

Utilizing [Moldex3D eDesign](#) to analyze the effect of conformal cooling system during injection and successfully reduce product deformation and cooling time to increase product capacity

## Benefits

- Improved warpage
- Reduced 33% of total cycle time
- Increased to 1.5 times of product capacity

## Case Study

In order to increase production yield rate, Zing Chuan tried to use a conformal cooling system to improve the heat-accumulated problem inside the product. Moldex3D helped design a suitable conformal cooling system and predict the outcome before tooling.

Moldex3D simulation results show heat accumulation issue in their original cooling system (Fig. 1). It will lead to product deformation. In order to understand the conformal cooling system's effect, they used Moldex3D to analyze its performance, and found that the part could indeed cool faster (Fig. 2).

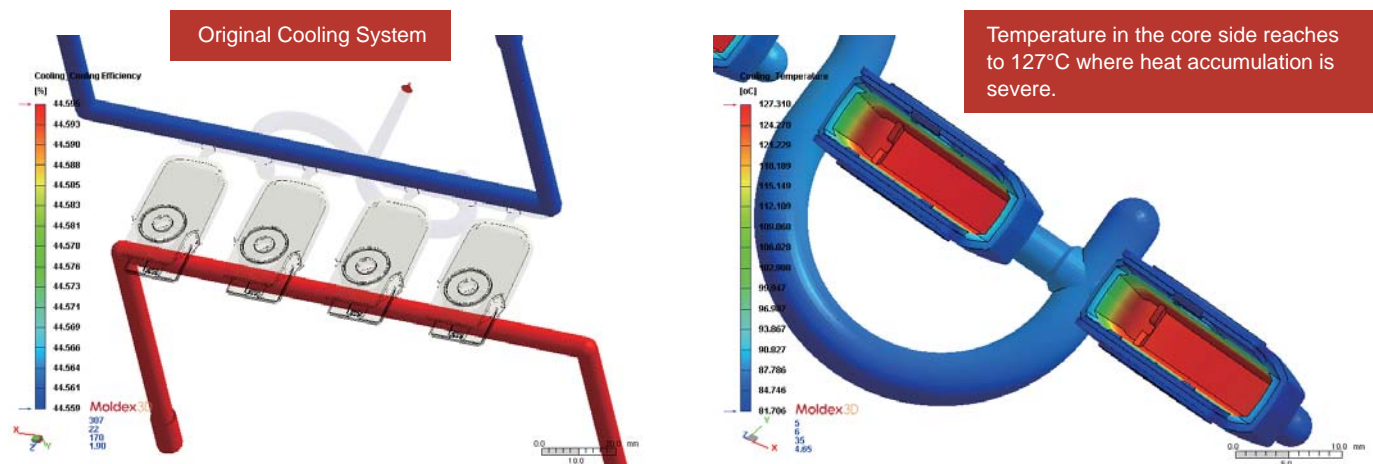


Fig. 1 In the original conventional cooling system, the core side has an extremely high temperature

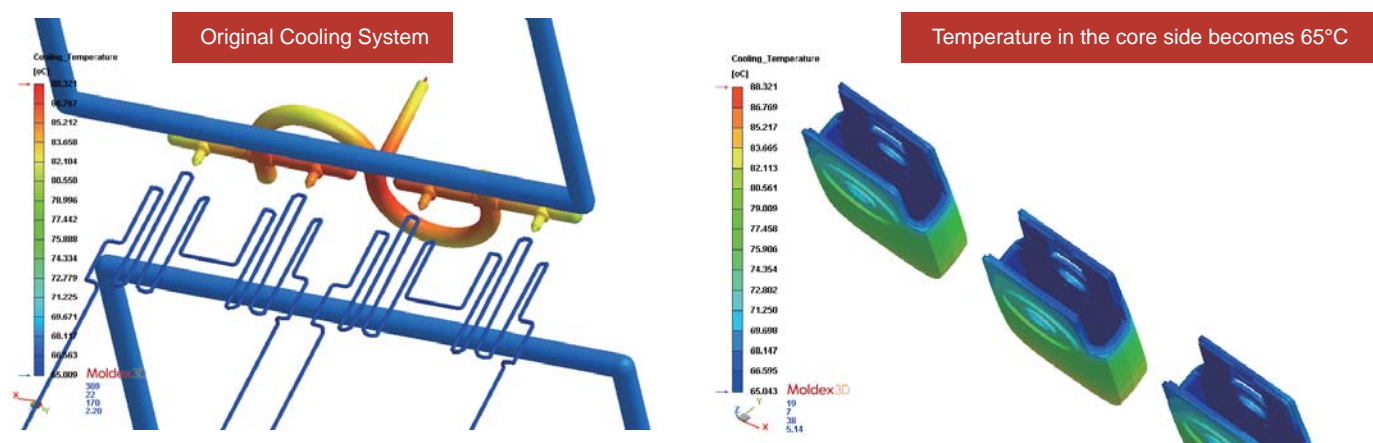


Fig. 2 In the new Conformal cooling system, the temperature has been reduced by 49%

In the original conventional cooling system, the temperature at the core side remains 100°C at the 12th to 15th second. With the application of the conformal cooling system, the temperature can be reduced to 70°C within 5 seconds. The warpage was also improved (Fig 3).

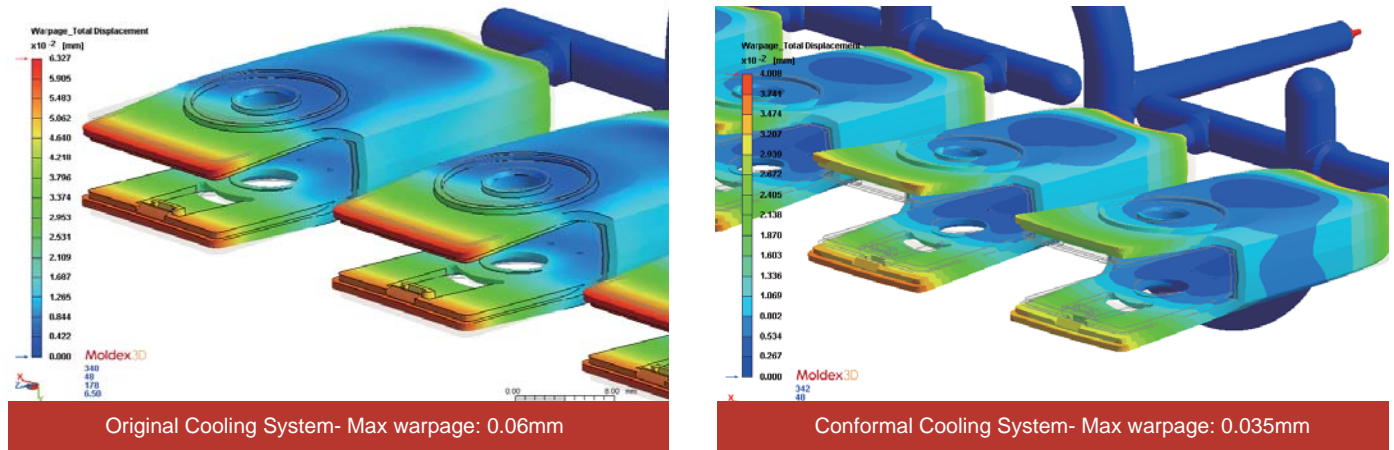


Fig. 3 Warpage was also improved with the conformal cooling system

As a result, the cooling time of the conformal cooling system (Fig 4) successfully reduced real time molding process from 17~18 seconds to 7 seconds. This cuts down the cycle time to just 1/3 of the original.



Fig. 4 Conformal cooling channel mold

## Results

Moldex3D provides users the ability to predict the performance of a new cooling system design as well as great confidence in building the actual mold and speed in finding the most suitable cooling time to increase production capacity.

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