

# An Optimized Injection System Can Improve Part Aesthetics and Moulding Process Efficiency at the Same Time

Customized hot runner injection systems designed and manufactured by Thermoplay S.p.A. are modified and refined during application studies in order to meet production requirements perfectly and to solve any aesthetic and functional problems that may arise.

One recent example involved the moulding of a large liquid-crystal display back cover for a flat-screen television from a blend of polycarbonate and ABS materials.

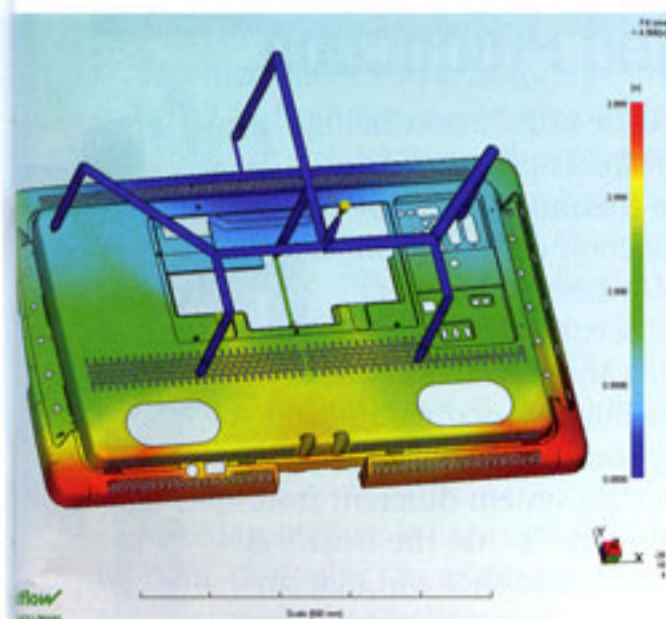
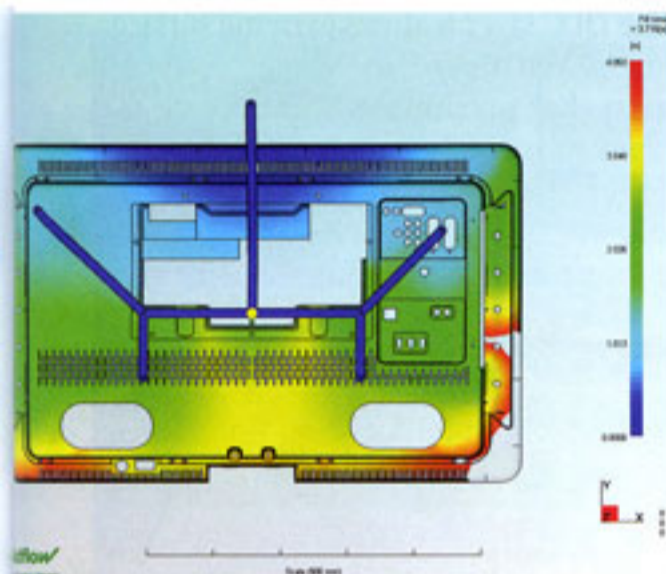
the resulting part not only looks better but is more robust as well.

The initial request was for five injection points, but a flow analysis performed by Thermoplay revealed that these were insufficient to correctly fill the part. The injection system was not balanced. The analysis enabled Thermoplay to define the optimum layout of the injection system's distribution channels and to determine the best distribution channel diameters and nozzle positions for correctly filling the part in the shortest time.

During the study, the filling of a critical joint was found to be problematic in a particular area (*upper image*), with an unaesthetic and functionally deficient part resulting. To solve the problem, a nozzle was moved. This resulted in more filling where needed, and the weld line was moved. The final flow analysis shows uniform filling of the part and an injection system in perfect balance (*lower image*).

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The injection system that has been developed by Thermoplay is supplied with six injection points for a single-cavity mould with six shutoff nozzles. The moulding cycle involves sequentially injecting the material into the mould cavity; the nozzles open and close at different times in order to achieve uniform filling of the part. Sequential injection was applied for two reasons: to reduce the operating pressure and to improve the aesthetics of the moulded part. As a consequence, joint lines are eliminated, and