Algorithm for calculating parameters of mold temperature controller

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Abstract

This paper presents a method to calculate the parameters of mold temperature controller based on the fast algorithm of mold water heating with these problems that it is difficult to calculate the parameters of injection mold temperature controller and it can't be simulated. According to the requirements of fast mold water heating algorithm, firstly, similar transformations are used to construct a similar model to obtain a similar model with the same solution of the fluid-solid coupling mathematical model of mold water heating. The temperature field of the mold after heating is obtained through rapid simulation of the similar model. Secondly, a constrained mold temperature control equation is established, and the iterative method is used to numerically solve the mold temperature equation to obtain the mold temperature controller parameters that meet the heating conditions. An example is given in this paper to show that the calculation method of mold temperature controller parameters presented in this paper has good practical value.

Full Text

Due to technical limitations, full-text HTML conversion of this manuscript could not be completed. However, the manuscript can be downloaded and accessed as a PDF.

Figures

Figure 1

Procedure of fast algorithm for water heating simulation of injection mold

Setting heating demand and allowed tolerance; giving out $[u_a, u_b]$ according to the velocity ranges of hot water for mold temperature controller; calculating the mold temperature corresponding to water flow velocity

Based on obtained mold temperature, computing mold temperature for split-half velocity, and judging whether to meet requirements.

If not satisfied the mold temperature requirement, back to step 2 and computing for split-half velocity, otherwise output the results.

Figure 2

Procedure of parameters calculation for mold temperature controller

Probe At 0.0968017 0.0209063 -0.124354 Temperature 357.993 [K]

Figure 3

Numerical result at step 2

Probe At 0.0968017 0.0209063 -0.124384 Temperature 361.252 [K]

Figure 4

Numerical result at step 2

Probe At 0.0968017 0.0209063 -0.124354 Temperature 360.795 [K]

Figure 5

Numerical result at step 3

Probe At 0.0968017 0.0209063 -0.124354 Temperature 361.079 [K]

Figure 6

Numerical result at step 4