



ON THE BASIS OF COMPUTER SIMULATION OF THE DESIGN OF RIFTS FOR STEEL CASTINGS OF COMPLEX CONFIGURATION

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Annotation

The inscribed sphere installation of the optimal profit option is considered in order to increase the production of a suitable technology for a 3D casting model and analyze the results of the ProCAST software package.

Key words: ProCAST, arrived, output of a suitable technology, nature of shrinkage defects.

Introduction

Along with the technological problems of foundry production, such as the elimination of shrinkage cavities and porosity, specialists are solving the problem of increasing the technological yield (ITY) by reducing the metal consumption of casting molds, which affects the amount of consumable material.

We carried out the design of the risers by the method of inscribed spheres according to the 3D model of the casting and the subsequent analysis of the results obtained by the ProCAST software package, in the course of this, various methods of casting the part were considered, while the ITY was 30% (Fig. 1, 2).

A further increase in ITY can be achieved by changing the configuration of the head in the more massive part of the part, i.e. on the big circle.





To facilitate calculations, a segment (1/4) was selected from the casting model. The profit in this work is built in the same way as shown in Figure 1-2, except that the height of the profit from the casting was three diameters of the thermal unit in place of two, the elements that feed the profit with liquid metal directly from the side were removed, then the position of the profit was changed and installed on top of the casting.

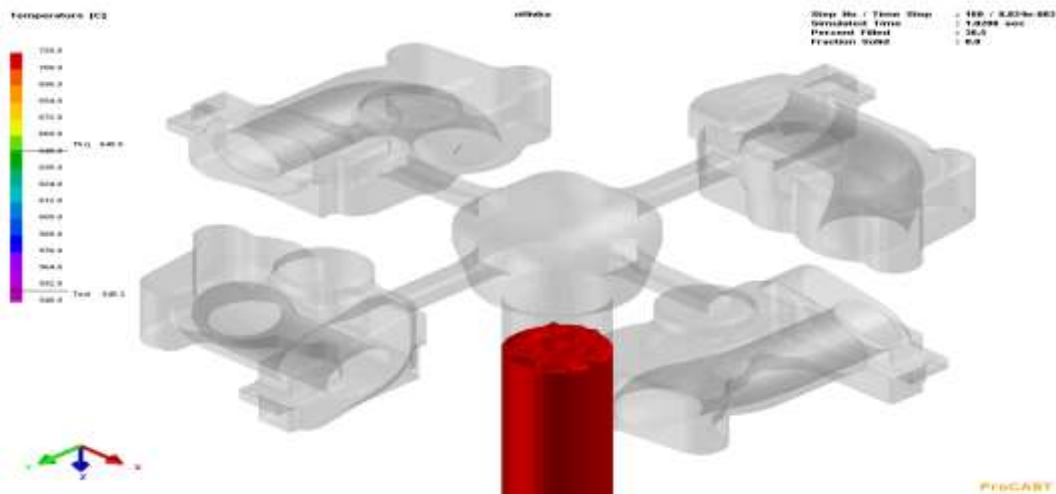


Figure 1. Casting filling scheme

Optimization of the top part profit design is as follows. The head is constructed using the inscribed sphere method and the top of the head has been moved to be parallel to the part. This led to a decrease in the consumption of liquid metal and, consequently, the volume of the profit itself (Fig. 2).

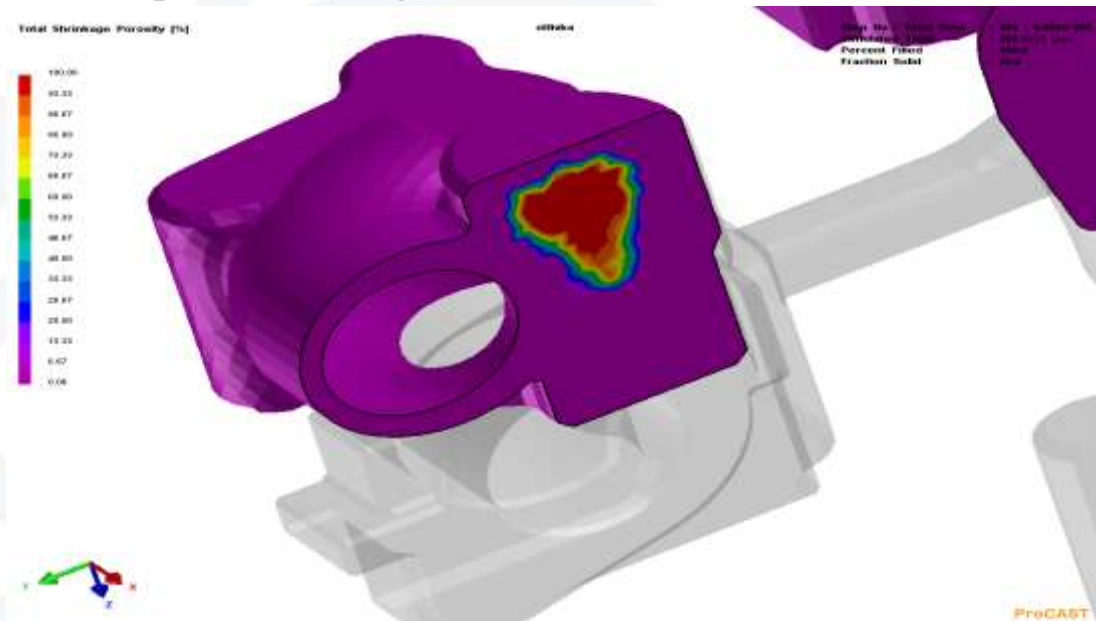


Figure 2. Zones of porosity along the section in the casting



The calculation of the ProCAST software package shows that the uniformity of filling and the direction of crystallization are ensured, shrinkage defects do not affect the body of the casting, remaining in the profit (Fig. 3). In general, a change in the configuration of the head did not affect the results of pouring, however, the technological yield of suitable for this design will already be 40%

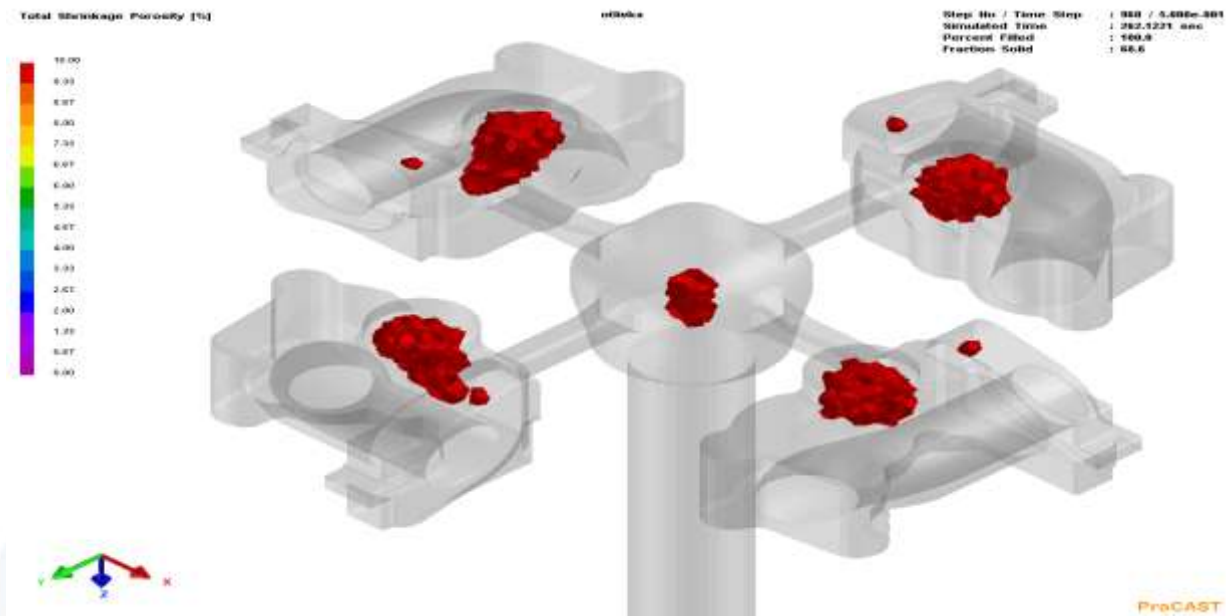


Figure 3. Zones of porosity along the section in a casting with a modified head

Thus, the use of the ProCAST software package for analyzing the casting results when designing a casting and a gating feed system not only significantly speeds up and simplifies the process of manufacturing a part, but also allows optimizing the ITY of a casting before it is put into production, which leads to a significant reduction in material and labor resources. According to the results of these calculations by the ProCAST software package, it can be concluded that the inclination of the profit head towards the central axis of symmetry of the casting is rational, since the increase in the ITY is 9%.

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