In parallel with the developing technology and industrialization, molding industry is a sector which usage area is expanding continuously. Because of these high-value-added casting products, mold technology is at the forefront of the sectors playing an active role in strengthening the national and international economy. Nowadays, conventional manufacturing methods are used in the production of molds. In recent years, it appears that significant advances have been made in the use of additive manufacturing technology (AMT) as a new method in the manufacturing sector. AMT is used as a very important production method which provides precision and production easiness in the production of small and complex geometric technical components which are difficult or impossible to produce by conventional manufacturing methods. In the conventional methods where cooling process is performed by using vertical and horizontal cooling channels formed on the mold body, since the cooling cannot be sufficient and homogeneous, the production time and production cost increase. Therefore, important problems such as hot spot defects and fire are emerging. Production quality molding technology in order to solve the problems of mold cooling process directly affects AMT methods contemplated for applications to do with the specific cooling channels and the mold can be cooled at high efficiency to 70% of the core and would be of substantial improvement of product quality were observed. In this study, the metal mold core with the conventional cooling channel and the metal mold core with the original cooling channel, which will be compactly produced by the AMT method, were compared in terms cycle time, product quality and production costs for the casting product. As a product in this work, an exhaust valve which is an important part of internal combustion engines is taken into consideration. These comparisons were made based on the results of the design and CFD (computational fluid dynamics) analysis. Accordingly, the temperature distributions obtained from the Sayfa 295 product and the solidification process of the product were investigated within the first 1 to 5 s after casting of the liquid metal using original and conventional cooling channel mold cores. The solidification process is 1.5 times faster than the original cooling channel mold core. According to the results obtained, it has been observed that the heat transfer and solidification of the metal are better in the original designed cooling channel mold core.