

Research on Effective Strategies for Improving the Level of CNC Machining Technology

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Abstract: With the continuous development of science and technology, China's CNC machining technology has also developed rapidly. CNC machining technology has been widely used in the machinery manufacturing industry. Compared with traditional ordinary machine tool processing technology, CNC machining technology can complete machining quickly and efficiently. However, as far as China's current CNC machining technology is concerned, there is still a certain gap with the international advanced level, which needs constant improvement. For the machining enterprises, the level of CNC machining technology determines the production level of the whole enterprise. Therefore, it is of great practical significance to explore effective strategies to improve the level of CNC machining technology.

1. Introduction

Due to the rapid development of CNC machining technology, various types of mechanical industry production have gradually attracted great attention to numerical control technology. Obviously, improving related technologies is an inevitable trend of current development. This requires us to take reasonable measures to improve the level of mechanical CNC machining technology. Only by doing so can we promote the good development of the company, and then enable the company to obtain considerable economic benefits. Based on this, the author based on his own experience, from the following aspects of analysis, and proposed some solutions for reference.

2. Overview of CNC Machining Technology

CNC machining technology is the basis of modern manufacturing technology, mainly refers to the processing technology issued by the control system, so that the tool can make various movements that meet the requirements of the instructions, and is used to complete the processing requirements of the drawings and processing requirements. It refers to the process of machining parts on CNC machines. Compared with traditional machining technology, CNC machining technology has significant advantages, mainly in: First, CNC machining technology can reduce the number of tooling. When machining more complex parts, complex tooling is often not required. If you need to change the size or shape of the part, you only need to change the part's machining program accordingly. Second, the processing quality of CNC machining technology is high. CNC machining technology has high processing precision and high repeatability, which is especially suitable for machining parts such as aircraft. Third, CNC machining technology has high production efficiency. In the case of small batch production, CNC machining technology can reduce production preparation, machine tool adjustment and inspection time of the process, thus greatly improving production efficiency. Fourth, CNC machining technology can process complex profiles. For complex profiles that are difficult to machine with conventional methods, CNC machining can perform machining and even process machining locations. Therefore, CNC machining technology can not only improve the production efficiency of enterprises, but also adapt to the development mode of modern industrial machinery automation. At the same time, CNC machining technology can also guarantee the quality of products and reduce the labor intensity of staff to a certain extent.

3. Factors Affecting the Efficiency of Mechanical CNC Machining

The mechanical control technology in the actual operation process is mainly based on the computer program to complete, in the process of programming, it also determines the production efficiency of CNC machine tools, so in the optimization of the CNC machine program programming, it can be better Improve the production efficiency of the machine, which is mainly reflected by the following aspects: First, the optimization of the numerical control technology program can better guarantee the use function of the machine tool and maximize the benefits of the machine tool use; secondly, for the program optimization work, Better guarantee the smooth operation of the machine tool, save a lot of time, improve the working efficiency of the CNC machine tool; Finally, the optimization program can effectively avoid the chance of the machine tool running in the empty knife. It can be seen from the above three points that optimizing the programming of the machine tool can better guarantee the working efficiency of the CNC machine tool.

The machining route of CNC machine tools is an important part of mechanical CNC mechanics technology. It can effectively improve the work efficiency for the accuracy of the tool. When the machine is used for large-scale machining, the CNC machine tools will be processed in a standardized way, according to the actual Production requirements, reasonable arrangement of the machining route of the machine, effective determination of the position of the tool, better shorten the time of tool change, can also better ensure the loss of equipment, and can also improve the overall efficiency, in certain To a certain extent, the production cost of the enterprise is saved.

Mechanical CNC machining technology is widely used in enterprises. In the process of applying CNC machining technology, due to the influence of the environment, the equipment itself has many problems. Under such conditions, the enterprise will be in actual production. It has serious impacts, and needs to distribute the machine tools with different degrees of wear. At the same time, the selection of different processing equipments is carried out by using more suitable machine tools. In the production of enterprises, the speed cannot be blindly pursued. It can be processed by some machine tools with low precision. Although such operation can temporarily improve the efficiency, it is inevitable that the equipment will wear when it is produced. Therefore, in order to improve the technical level, it is necessary to improve the operating state of the equipment. It is necessary to repair the equipment and perform routine maintenance to effectively improve the quality of mechanical data processing.

4. Some Suggestions for Improving the Level of Mechanical CNC Machining

The level of mechanical CNC machining will have a direct impact on the future development of the company. In order to promote the good development of the manufacturing industry, it is necessary to take appropriate measures to improve the level of mechanical CNC machining and improve its technology. Only these Only then can the technology move in a better direction.

Relevant personnel should pay attention to the comprehensive quality of training programmers, so many requirements are put forward for the professional level of these employees. The knowledge level of programmers is closely related to the quality of procedures. If data technology can be improved, then It is necessary to increase the intensity of training programmers' comprehensive ability, cultivate their professional level, and promote the numerical control processing form to achieve the expected results, thereby improving the overall level of machine tool processing. The development of an enterprise is inseparable from the excellent talents. Only by raising the level of talents can the company develop in a better direction and obtain considerable economic benefits, laying a solid foundation for the company to enter a new stage.

The smooth operation of CNC machining and programming requires the support of relevant technical personnel. CNC talents play an important role in improving the level of mechanical CNC machining technology. If the professionalism of the CNC machining operator is not strong, it is difficult to make the CNC machining method play its role to the maximum extent, and the quality of the produced product is often not guaranteed, and to some extent, it may cause damage to the

numerical control equipment. In turn, the service life of CNC equipment is shortened [4]. Therefore, when selecting CNC operators, enterprises should select good talents and train a group of high-quality professional CNC talents. At the same time, enterprises can also introduce high-quality CNC talents, which can not only guarantee CNC. The smooth implementation of processing technology, at the same time, can also reserve more professional talents for enterprises to protect the long-term development of enterprises.

Because the technical level of programmers has a direct impact on CNC machining technology, it is of great significance to improve the professionalism of programmers to improve the level of CNC machining technology. First, the company should conduct regular or irregular training for programmers, update the knowledge level of technicians in a timely manner, and enable technicians to master advanced technology in a timely manner. Secondly, advanced computer simulation technology can be used to simulate the operation of CNC machine tools to ensure optimization. The latter program is able to complete the production and processing tasks quickly and efficiently. At the same time, the relevant staff should shorten the debugging time of the program as much as possible, thus improving the working efficiency of the CNC machine tool; in addition, the programmer should fully grasp the various work instructions in the CNC machine tool, and should also clearly understand the CNC machine tool. The internal hidden function ensures the working efficiency of the CNC machine tool. Finally, when programming, the programmer must combine the specific conditions of the CNC machine tool to ensure the practicability and reliability of the programmed program, and avoid the phenomenon of “empty knife” to the utmost extent. happened.

Due to the indispensable position of the cutting tool in the machine tool, it also has a direct impact on the machining level of the machine tool. Therefore, the performance of the cutting tool will cause great interference to the processing quality. For example, the wear resistance of tools such as ceramic blades is better than other steel knives. When the machine tool is actually in operation, it is produced. The quality will also achieve a reliable effect. Only in the actual production, the company can improve the processing performance of the CNC technology. Obviously, adopting proper processing methods and scientifically classifying various types of tools is an inevitable trend of current development. This is because not all equipment can be applied to the same tool, so be sure to classify it properly. For ball-end tools, neither the machining quality nor the cutting level can be compared to the flat-head tool. However, the ball-type cutter can ensure that there is no overcut in the actual processing, so in order to promote the company to improve the processing level, it is necessary to select the machine tool according to the actual situation, and then promote the company to develop in a good direction.

Since the machine tool plays an important role in mechanical CNC machining, the flexible use of the machine tool can exert its maximum value, and it also has a positive significance for improving the machining precision. First of all, relevant enterprises should take appropriate measures to enhance the maintenance awareness of relevant personnel. At the specified time, it is necessary to make depreciation work for mechanical processing equipment, and also need to repair related equipment, so that it can be found and solved in the first time. The shortcomings in the machining equipment lay a good foundation, and also promote the important guarantee that the machining equipment can achieve safe results. Obviously, the maintenance of machining equipment is a long-term and cumbersome task, which requires the relevant personnel to enhance maintenance awareness, and put a lot of time and energy into the maintenance and maintenance of processing equipment, the only way to do this. Improve the precision of mechanical equipment, and thus create favorable conditions for the smooth development of maintenance and maintenance work. Not only that, but also need to provide financial support for the maintenance and repair of mechanical equipment; secondly, in the process of processing machinery, scientific classification should be done according to the type of parts. Since roughing and finishing have different requirements, it is necessary to standardize each process and use the right machine tool to make the machine work to the maximum value. Therefore, to improve the level of mechanical CNC machining must achieve the scientific use of CNC machine tools.

Since CNC machine tools and ordinary machine tools have certain differences, if the CNC

machine tools are still managed in the traditional way, it is likely to cause a certain degree of damage to the CNC machine tools. At present, the centralized computer management mode is a management method that is applied more in the management of CNC machine tools. The so-called computer centralized management mode mainly refers to the use of computers and related technologies to search and organize the processing information in CNC machine tools, and share the relevant technical personnel to communicate on the network. To achieve online communication, online office, etc., the application of this management method can not only shorten the preparation time before processing, but also greatly optimize the logistics route, thereby improving the efficiency of production and processing. This management method effectively combines computer technology and numerical control processing technology, and is an important way to improve the level of processing technology.

When processing some large-volume parts, the staff must distinguish whether the parts belong to the roughing or fine processing category. This is mainly because the different machining methods have different requirements for the numerical control equipment. Among them, the rough machining parts are not. High machining accuracy is required, and processing efficiency is mainly guaranteed. If high-precision numerical control equipment is used for machining, it is very likely to damage the precision of the numerical control equipment. Therefore, numerical control equipment with relatively poor precision and long-term use is usually used. For processing, the high precision and newly purchased CNC equipment is used as a special equipment for fine machined parts. This not only ensures the rational use of resources, but also minimizes the damage of the machining process to the mechanical numerical control equipment, thereby prolonging the service life of the numerical control equipment and improving the working efficiency of the numerical control processing equipment. In addition, in order to reduce the economic loss caused by equipment loss, the company should timely repair and maintain the CNC equipment. Once the CNC equipment is found to have problems, professional technicians should be dispatched for maintenance.

5. Conclusion

In summary, with the continuous development of technology, the market has put forward more requirements for the level of CNC machining. In order to cope with the challenges of the market, only by constantly seeking ways to improve the efficiency and level of CNC machining technology can we improve the production efficiency of the enterprise, protect the economic benefits of the enterprise, enhance the competitiveness of the enterprise in the market, and also help the entire manufacturing industry. The development of more efficient and high-tech, the entire manufacturing industry has a broader development prospects.

References

- [1] Chen Jieping, Feng Wutang, Guo Wanshan, et al. Research on the separation and processing performance of the engine connecting rod big end [J]. Journal of Anhui University of Science and Technology, 2011, 25(2): 37-42.
- [2] Meng Aiying. The status quo and development prospects of networked CNC machining system [J]. Machine Tool and Hydraulics, 2012, 40(5): 148-150.
- [3] Sun Yerong, Yao Bin, Zhang Chunyu. Research on optimization of machining path based on TSP and plastic mold thimble hole group [J]. Mechanical Design and Manufacturing, 2010 (10): 241-243.
- [4] Yang Haihui. Error analysis and modeling of THG400 horizontal machining center [J]. Journal of Anhui University of Science and Technology, 2013, 27(3): 37-41.
- [5] Wang Xiaoming. Application of PLANAR - MILL in UGCAM [J]. Journal of Anhui University of Science and Technology, 2007 (2): 35 -39.