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The application of CNC laser engraving technology in the porcelain base style

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Abstract: The progress of science and technology also promotes the progress of art, the birth of new technology at the same time promotes the progress and development of art, the two complement each other. It only occupies a small part of the whole development history of ceramics, but as a witness of the historical development of ceramics, it has witnessed the development of ceramics. With the development of The Times, all kinds of innovative significance of the bottom of the emergence, the emergence of CNC carving technology, also changed the production of ceramic bottom, to a certain extent to broaden the development space of ceramic art.

Keywords: Laser Carving Type of Bottom; Type Porcelain Ceramics

Introduction

At present, after the continuous development of computer technology, people gradually toward the digital age, throughout the whole development process of computer technology, digital technology is becoming more and more important, with the promotion of social status, gradually become the mainstream of social development. Digital technology is widely used, widely used in products, industries, design and other fields, and can be said to be closely related to people's lives. Cross-field scientific research has always been an important hot topic of scientific research discussion, and cross-field disciplinary cooperation has always been the focus of scholars, and the integration of science and art is one of the key contents. With the continuous progress and development of modern scientific and information technology, there are more and more advanced processing means, and people have more and more choices. From CNC processing to high power uninterrupted laser cutting, the development of CNC technology makes the ideas that only exist in the virtual world into real works in reality. And the emergence of numerical control carving technology, but also brought a new method for the production of ceramic bottom money.

1. The influence of CNC laser engraving technology

Laser is the light radiation formed by electrons outside the nucleus by laser radiation. Laser processing process is the use of high power focused laser beam, according to the computer parameter information of the exposed object in the moving process of melting, ablation, to achieve non-contact cutting, etching process. Laser processing technology relative to other traditional material processing technology, laser material processing for high hardness, high brittle material processing has obvious advantages, laser material processing technology at the beginning of the world is widely used in various industrial production field, with the mature modern laser material processing manufacturing technology, its processing use more and more widely, it has replaced the traditional cutting processing technology trend, gradually become more and more important material processing technology.

The working principle of laser engraving machine is to use high power density of focused laser beam action on the material surface or material interior, the material physical changes, it is a kind of laser processing. The material presents a specific pattern can be achieved by controlling the spot size, the trajectory of the motion of the laser, the size of the energy output and other parameters.

Different laser engraving materials and parameter differences, the shape and size of the carving will also change. In the process of carving, the machine basically does not rely on molds, so laser carving has the advantages of high carving precision, narrow cutting seam, less material cost, no contact, low production cost and high production efficiency.

In addition to high efficiency and cost saving, environmental protection is also a big advantage of laser engraving can not be ignored. Firstly, the heat emitted by the laser engraving machine is smaller, so in the engraving process, it can effectively reduce the cost saving effect; secondly, laser engraving is less noise than the traditional engraving; Finally, the traditional engraving produces a lot of dust, and the laser engraving machine is more green and environmentally friendly.

Digital graphics are essential for laser engraving. The commonly used computer graphics software of laser processing machine is Adobe Photoshop, CorelDraw, CAD and other computer graphics software, and the commonly used file format is DWG or vector diagram pictures. When drawing digital figures, the unit needs to be set in advance, and the machine will be processed according to the set size. The graphic line drawn by the computer graphics software lock is the movement track of the laser when carving.

At present, laser engraving has been widely used in metal, ceramics, wood engraving and other fields. Due to its various advantages, in recent years, in the field of art also began to be widely recognized and applied.

2. CNC laser engraving technology and ceramic base style knowledge

Model is a unique cultural phenomenon of ancient Chinese art, calligraphy and painting, some at the bottom of the ancient ceramic ware will have some, so the ceramics know so also known as the bottom, as early as the pre-qin period of some ceramic relics, there are some engraved or printing workshop name, name and craftsmen name, han dynasty tile when also appeared a lot of auspicious seal script, these can be said to be the source of the ceramic ware base. In the pre-Qin period, the informative content was far from more diverse than today, and the focus was on expressing some specific content, such as producer, production date, production area and so on. There are many forms of porcelain knowledge, including writing, engraving and printing. Writing has color books, ink books, etc. As a witness of the development of ceramics, the bottom style mainly plays a role of identification, as a part of the ceramic ware, it generally falls on the bottom, shoulder, abdomen and so on.

The bottom money is relative to the porcelain is an ID card, is generally at the bottom of the text and pattern, the text generally indicates the production time of the appliance, the production place and the producer and other information, and the pattern is generally to indicate the workshop logo or ideological sustenance.

Before the birth of porcelain, pottery has the bottom of the trace, but due to the production technology is not mature, the bottom just said some specific meaning, did not use the bottom of ceramic decoration, basic method only characterization, in the form is relatively single, with the development of ceramic technology, people on the bottom of the model and aesthetic gradually have a unified standard, to the Ming and qing dynasties, the bottom of the production method basically reached the peak of history, performance method not only have engraving, also have painting, various expression of various kinds, beautiful and generous.

For example, Ming Hongwu blue and white porcelain bottom, Yongle Dynasty porcelain bottom, the number is small, but to the creation of porcelain bottom has brought a certain influence. At this time, the creation of the bottom money is the initial period, so there are no too many rules and restrictions, appear much more free, and do not need to be limited to the bottom of the year number. In the period of Kangxi of the Qing Dynasty, the development of porcelain bottoms entered a period of high development. While retaining the tradition, people created a variety of porcelain bottoms, such as animal, plant, auspicious and so on. The pursuit of elegant literati atmosphere was extremely popular at that time, reaching the extreme in history.

The bottom model has experienced a long time of development, and the ceramics have been integrated and inseparable. As a part of ceramics, it has witnessed every step of the development of ceramics, to the bottom of modern ceramics still plays its historical role, according to the content can be divided into: name, pottery, auspicious words, and so on. In the field of artistic creation, the bottom style of ceramics is more expressive, and as a commodity of ceramics, its bottom style has been fully played. Nowadays, the bottom style is becoming the most

free language in the ceramic art. Its meaning has changed from the production time, production place and producer to the more rich connotation, sometimes even it cannot be understood or explained by others except the author.

In today's market economy, the development of ceramics is developing in two directions together, one is a more pure art, the bottom style has its free sky here, and the other is the industrial ceramics directed by the market and economy.

In today's economic society, the development of history, culture and politics all revolve around the economy. The economy also extends the original significance of ceramic bottom money, attached to its popularity, dilute its artistic evaluation, so that ceramics and bottom money also embarked on the road of commercialization and trademark. The bottom money of commercial ceramics is the name of the enterprise, is the brand of the enterprise, is the intangible asset in the consumer group, is one of the capital it rushed out of the local, to the world, and this is also the new field that the ceramic bottom money can not reach. With the development of The Times, the pursuit of new ideas of the emergence, the emergence of CNC carving technology, also changed the production of ceramic bottom, so as to broaden the development space of ceramic art to a certain extent.

Using laser engraving will be more efficient and convenient than other methods. Before carving the bottom, use the graphic design software to make the electronic version of the bottom in advance, and then input the file into the machine can quickly make the bottom on the ceramic products. Due to the maturity of computer technology, the electronic version of the bottom is more convenient, in daily life most people will use this way to carry out the production of the bottom. Using the traditional way to make the bottom will be time-consuming and laborious, can not ensure the accuracy of each ceramic bottom production, digital laser engraving technology to ensure the accurate processing, but also the whole bottom production process is simple and convenient. After digital control, the bottom production scheme can be modified in time, reduce the impact of size, pattern and other details changes. Because it is digital processing, it can significantly save manpower and material resources, to a certain extent to improve economic benefits.

Usually, for the shape and content is more complex, the production cycle requirements are short bottom is suitable for the use of laser engraving machine processing operation, in the case of many varieties and mass production, CNC laser engraving machine can better save manpower and material costs.

According to the characteristics of nc laser engraving processing and a large number of application practice at home and abroad, CNC operation for the precision of CNC laser engraving machine made important guarantee, artists in the creation of porcelain art works can be more energy into the creation, no longer for carving with rich details of money, also can fully grasp the art of every trend change.

3. The application exploration of CNC laser carving technology in the bottom type of porcelain

Computer graphics design software and laser engraving are complementary to each other, carving opportunities according to the map processing, and printer printing mode has the same place, there are also different places, laser engraving according to the working mode can be divided into dot matrix carving and vector cutting carving. The former laser beam acts on the surface of the material to carve; the latter is the laser beam penetrates through the material to cut.

Both 2 D engraving and 3 D engraving laser engraving machine can be processed. This paper takes two-dimensional carving as the object of production, usually, the ceramic bottom production is the laser of the ceramic surface glaze layer shallow glaze removal processing, such processing effect is generally suitable for the matte glaze layer, and the use of low power and high speed equipment parameters to process the ceramic surface glaze layer.

The thickness of the glaze layer attached to the ceramic surface is about a few millimeters, and this shallow removal processing is the removal of the glaze layer processing thickness control within a few millimeters, not to completely penetrate the glaze layer, carved out the same color with the glaze layer but different reflective rate with the glaze layer. This decorative effect is generally not easy to be noticed by people in the distance, but when the viewing distance is narrowed, it can show a subtle decorative effect through different light refractive index, giving the audience a kind of visual feeling of "still holding the pipa and half covering the surface".

More common laser processing ceramics with some modern ceramic utensils or some tea, this is just a shallow processing effect, not

completely destroy the glaze layer, in vessels with food or tea, will not make the residue penetration into the body lead to difficult to clean, the second user in the use of utensils at the same time, can also gradually found the shallow matte bottom pattern, to feel the additional aesthetic feeling of vessels.

The laser engraving machine is divided into three operation steps during processing, namely, the preparation of processing documents, the control software operation of the laser engraving machine and the operation equipment during processing.

3.1 Preparation of the laser engraving image files

Laser engraving machine for JPG file pixel requirements, low pixel file after the amplification will be overall fuzzy, does not conform to the requirements of the processing, processing effect will be very poor, when the file pixel is too high, can lead to software card and program crash, generally picture pixels to 1.5 million for the best, the final product effect is better, also won't lead to software lag and crash.

This paper uses the Adobe Photoshop 2020 image processing software. The processing process is performed as follows:

(1) Open the Adobe Photoshop running software and create a canvas of 1cm * 1cm:

(2) Click the text tool, input the text "file", the font is square small seal script, the font size is 25 points;

(3) Add coating mixing mode to the picture and add 1 pixel frame;

(4) Modify the image resolution, change the image resolution to 300 DPI;

(5) Output the JPG picture format, and the final output picture effect is as follows.

After the picture output into the laser engraving machine, the first step to check the size of the file, generally mm, attention must be less than the processing area of the equipment bench, when the file problems, to repair the file first. After the repair work is completed, click the file button to find the corresponding file and click the OK button. After the picture is input, as shown in the figure.

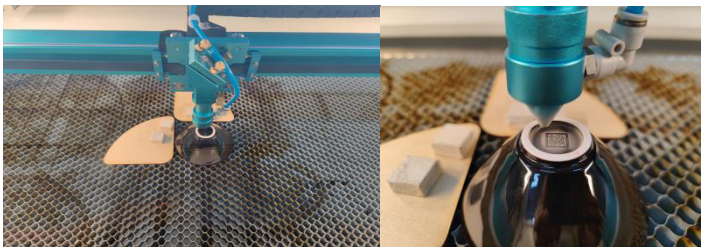
3.2 Laser equipment operation

Place the material in the upper left corner of the equipment processing table, align the equipment scale line in the x axis and y axis direction, align the upper left corner of the material at the zero. If the material is uneven, flatten the material on the edge, adjust the x axis and y axis the motion through the control panel, move the laser reflector to the upper left corner, check whether the laser beam spot can shine to the upper left corner of the material; after confirmation, focus the material in the z axis direction.

3.3 Control software settings

Open the laser engraving machine, but open the control software of the laser engraving machine, after the data connection, set the pa-

rameters of the engraving machine, such as processing speed and power to ensure the accurate completion, is the premise of the stable work of the laser engraving machine. After the preparation, the laser engraving table is shown in Fig. All the parameters in the control software must be set accurately to ensure the best effect after carving. After waiting for about 15 seconds, the carving can be completed, and the final product effect is shown in the figure.



3.4 Safety operation matters of the laser engraving machine

Laser engraving machine must pay attention to fire prevention work, in the operation process of the machine, someone must monitor the working condition of the machine in real time, can not leave the machine without permission. Because laser processing is energy intensive high temperature processing, the equipment cannot switch the machine at will, open the cover and avoid touching the machine to avoid causing damage to the machine; to close the machine in time to prevent the machine from emitting laser and harming others. When operating the machine, the head and other parts of the body into the machine, do not stare at the laser to avoid harming the eyes; When the machine fails, immediately press the emergency stop button to cut off the power of the machine.

4. Conclusions

Laser engraving technology is used more and more frequently in modern times. Compared with the traditional engraving technology, laser engraving technology can give people a high-precision engraving experience. Different materials will also have different artistic effects. CNC carving technology provides a new technical means for the porcelain bottom production, adjust the parameters of the machine, you can achieve a variety of different bottom effect. The charm of CNC carving technology lies in its convenience and speed, the intervention of the machine brings new bottom appearance and massive results.

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