

# Wheel centre manufacturing

Technology



Resume The fabrication of the wheel centre through machining process is complicated task. However the fabrication of the wheel centre through casting is relatively simple. The fabrication of the die is however a major challenge, but it is recommended that the die shall be designed with certain margins, and the end product through casting shall be machined to edit such tolerances. The fabrication of the die for such job is possible through Computer Numerical Control machines; however it is important to understand that design should incorporate sufficient margins which shall be later addressed through machining. The wheel centre is crucial job piece, as it includes cutting at certain curvatures. It is recommended that the Computer Numerical Control machine should be used for fabrication of the wheel centre with rough units.

#### CNC Fundamentals

The application of the Computer Numerical Control machine is limited to the fabrication and machining of the die. The Computer Numerical Control adopts a simplified approach, where the cutting tool has to be instructed certain positions, the Computer Numerical Control machine will verify that the tool moves to those locations, and during tool movement the programmer has the right to give the feed to the tool. The feed rate of the tool will automatically result in the cutting or grinding operation on the job piece. The machining through Computer Numerical Control machine is therefore simplified and result-oriented. The Computer Numerical Control machines has minimised the possibility of human error. The only issue with the Computer Numerical Control machine has been its travel rate, which is relatively slower. The reason behind slow operation is to give ample time to the programmer to review and decided whether to proceed with the ongoing <https://assignbuster.com/wheel-centre-manufacturing/>

program, followed by the fact that fast motion often correspond to poor surface finish. The Computer Numerical Control machines are consistent in their output, and the quality of the machined product is identical for all the units.

#### Part Analyze

The job piece has to be heated, and turned molten for casting purpose. It is important to conduct certain non-destructive tests prior to heating the job piece. The hardness of the job piece shall be measured, and its magnitude shall conform to the ASTM standards. The eddy-current testing of the job piece is essential to investigate the existence of internal cracks inside the piece. The material for the fabrication of jig, which in majority of cases is steel, shall be inspected for certain quality checks.

#### Machining Process

The machining process of the jig is critical. The jig shall be fabricated such that it has dimensional tolerances. The machining of the jig is recommended on the lathe machine, and boring machine shall be required for drilling holes. After the formation of the jig, it is important that the molten liquid shall be inserted in the die continuously, to avoid accumulation of cavity inside the die. Once the molten liquid is poured inside the die, the die shall be cooled for ample time. After the casting is complete, the acquired geometry shall be machined to conceive the actual dimensions. The machining on lathe machine is recommended, this step will bring the geometry within the dimensional tolerances.

#### Machining Program

N5 G90 G20

N10 M06 T3

<https://assignbuster.com/wheel-centre-manufacturing/>

N15 M03 S1250

N20 G00 X5Y5

N25 Z0. 5

N30 G01 Z-0. 2 F5

N35 X3 Y2 F10

N40 G00 Z1

N45 X0 Y0

N50 M05

N5 G90 G20

N10 M06 T3

N15 M03 S1250

N20 G00 X3 Y4

N25 Z0. 1

N30 G01 Z-0. 125 F5

N35 X5 Y4 F10

N40 G00 Z1

N45 X0 Y0

N50 M05

N55 M30

### Quality Aspects

After the machining of the job piece is completed, the part should undergo certain inspection tests to ensure the integrity of the product. The dye-penetrant testing is recommended, this test will verify the existence of the external cracks on the job piece, these cracks can be attended through grinding. The ultra-sonic flaw detection technique is recommended, this technique will verify the existence of the internal cracks within the job piece.

<https://assignbuster.com/wheel-centre-manufacturing/>

The emery paste shall be applied on the job piece to acquire desired surface finish.