

Stub shaft manufacturing

Technology



Resume The manufacturing of the stub-shaft is different from manufacturing of shafts for centrifugal pumps. It neither requires forging nor casting. The machining is the key and major manufacturing procedure for the fabrication of stub-shaft. The manufacturing shall be followed by some crucial pre and post machining inspection checks, this will ensure dimensional, geometric and characteristics homogeneity of the job piece.

NC / CNC Machines

Computer Numerical Control can be regarded as smart approach for the manufacturing of stub shaft. The tools required for the manufacturing of the stub shaft through CNC includes cutting tools of different sizes. The Computer Numerical Control is program through which the tool shall operate under numerical commands. The advantages of the manufacturing of stub shaft through Computer Numerical Control include the superior quality of the finished product, with " accuracy, repeatability, and freedom from operator-introduced variations". The reduction of scraps is possible through this numerical control operation, and possible human errors can be accounted for through this digital mechanism. The Computer Numerical Control has been successful in the reduction of the production downtime especially during manufacturing of stud shaft, and other geometrical aligned units. The advantage of the Computer Numerical Control is that it has advanced machine control. However the Computer Numerical Control has some limitations, their feed rate and cutting rate is slower than conventional machines. The finished product through CNC is not error-proof, rather it has some errors.

Part Analyse

The material required for the stub shaft shall be huge cylinder. It is important <https://assignbuster.com/stub-shaft-manufacturing/>

that prior to machining following quality checks shall be executed to ensure and verify the material compatibility and characteristics. The material for the shaft shall undergo material identification test, the details of the constituents of the material shall be verified against standard. The integrity of the material can be ensured through certain non-destructive tests i. e. dye penetrant tests, ultra-sonic flaw detection and eddy-current testing. The application of dye-penetrant test will assist in the verification of the existence of the external cracks on the job piece. The application of ultra-sonic flaw detection and eddy current testing will assist in the verification of internal cracks on the job piece. The hardness testing on the job-piece shall be conducted; this exercise will determine the strength of the material. Based upon acceptable analysis of all these tests, the job piece shall be allowed for machining.

Machining Process

The forging is the recommended technique for the shafts, however in the case specific case the forging is not recommended for the manufacturing of stub shaft. The machining of the job piece will eventually give us the required geometrical and dimensional characteristics. The machining of the job piece shall be conducted on lathe machine. The sharpness of the cutting tool shall be ensured, this will confirm appropriate material removal without leaving marks on the job piece. The drilling from the large diameter side of the stub-shaft is required, which can be exercised on drilling machine.

Machining Program

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N05 G54 G90 S600 M03
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N10 G00 X2. 0 Y2. 0
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N15 G43 H01 Z. 1 M08
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N20 G01 Z-. 75 F3. 5

N25 G00 Z. 3 M09

N30 G91 G28 X1 Y1 Z1

N35 G90 G20

N40 M06 T3

N45 M03 S1250

N50 G00 X3 Y3

N55 Z0. 1

N60 G01 Z-0. 125 F5

N65 X4 Y5 F10

N70 G00 Z1

N75 X0 Y0

N80 M05

N85 M30

Quality Aspects

After the completion of the job piece, the object shall undergo following inspection checks to ensure appropriate quality of the job piece. The job piece shall undergo dimensional verification, and scraps shall be removed through machining. The surface imperfection shall be controlled through application of emery paste. The non-destructive testing shall be conducted on the job-piece to verify the strength of the material. The dye-penetrant testing should be exercised to verify the existence of external cracks, if any. Such external cracks can be removed through grinding, or material build-up however the job piece has to undergo slight machining then. The material should also undergo ultra-sonic flow detection; this will assist in the presence of the internal cracks within the job piece.

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