

EMBOSSING DIE PLATE (MEDAL)

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ABSTRACT

The manufacturing of an embossing die plate for medal production includes complex approaches in metallic fabrication to attain precise and difficult designs. This mission goals to explore the numerous levels and strategies concerned inside the advent of this kind of die plate, thinking about elements together with material selection, design concerns, production methods, and best warranty.

The abstract will delve into the following key aspects:

Introduction to Embossing Die Plates: Explanation of the significance of embossing die plates in medal production.

Importance of precision and durability in die plate fabrication.

Material Selection: Analysis of different sorts of steel steels appropriate for embossing die plate production. Consideration of factors inclusive of hardness, toughness, and machinability.

Design Considerations: Discussion at the layout necessities for embossing die plates, which include depth, relief, and intricacy of the layout.

Importance of virtual design tools and software in developing unique die plate designs.

Manufacturing Methods: Overview of the manufacturing strategies involved, which include CNC machining, laser slicing, and EDM (Electrical Discharge Machining). Detailed rationalization of each step concerned in reworking a raw metal plate right into a functional embossing die plate.

Quality Assurance: Examination of quality manage measures carried out during the manufacturing procedure.

Discussion at the importance of accuracy and consistency in die plate fabrication to make sure wonderful medal production. Applications and Future Directions: Exploration of ability programs past medal production, such as embossing for cash, badges, and decorative gadgets. Consideration of advancements in substances and production techniques that could in addition decorate the efficiency and great of embossing die plate production.

1. INTRODUCTION

Metal forming is one among the producing procedures which can be almost chip much less. These operations are specially accomplished through the help of presses and press gear. These operations include deformation of steel paintings pieces to the favored length and form via applying stress or force. Presses and press equipment facilitate mass production paintings. These are considered fastest and maximum green way to form a sheet metal into completed merchandise. The gadget used for press running operations is called a press device. A press tool specifically consists of a die and a punch which can be especially designed to get a factor of the desired shape. . The thing with the desired form is produce the usage of sheet metals. The sheet metal is positioned on the die and the punch is then diminished underneath a heavy pressure. The metal is accordingly pressed among the die and the punch so that the aspect with desired form is obtained. A revolutionary tool performs multiple operations in collection as the stock registers at distinctive workstations at some stage in every stroke leading to the improvement of the final issue. This paper objectives at highest quality design of a innovative press tool using CATIA and ANSYS. Analysis is done in an effort to prevent sensible problems and strive-outs. Moreover, it presents an possibility to incorporate changes and modifications in the layout when wanted.

2. METHODOLOGY

- First, we planned to make medals in our mechanical workshop with assist of our professors by way of the usage of conventional machining system.
- So, we come to realize that some problem faced via us. That, the price and timewhich we eating turned into extremely high as compared to medal available in an open marketplace.
- So, we deliberate to reserve a few medals from the marketplace. But, again this time changed into lots consuming.

- There have been many defects, dents, and faults in medals we ordered from save. We had to go back the medals returned to save. The tour time changed into veryingesting.
- So, on the cease we came at the belief to make a Press Tool for medal shearing.
- But, nevertheless making two exceptional dies way it is able to have additionally took extra time for the manufacturing system.
- Finally, we made a plan to make a Progressive Slotting and Piercing tool For medal shearing.

3. MODELING AND ANALYSIS

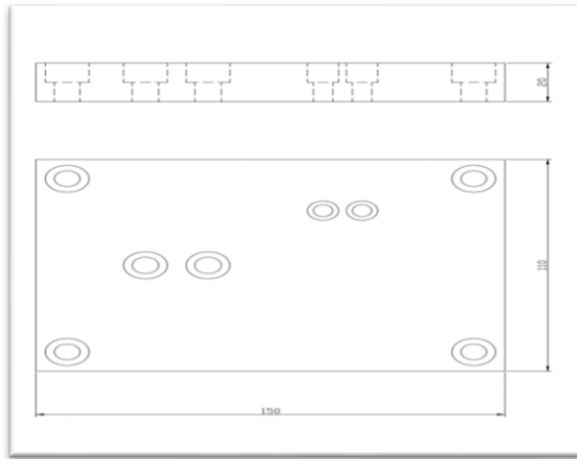


Fig 1. Design of Top Plate

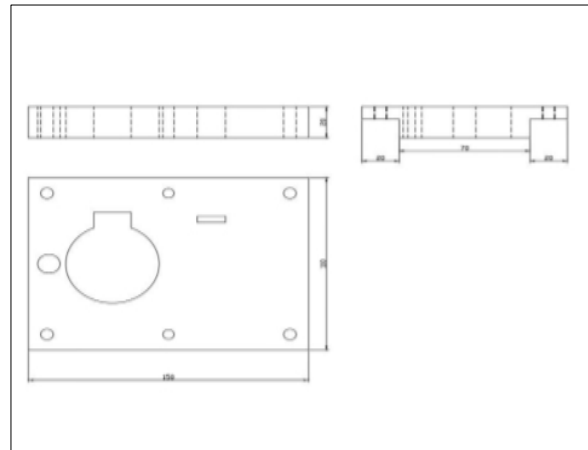


Fig 2. Design of Stepper Plate

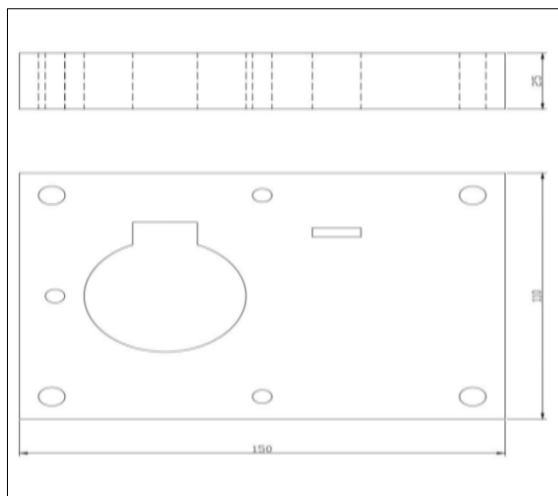


Fig 3. Design of Die Plate

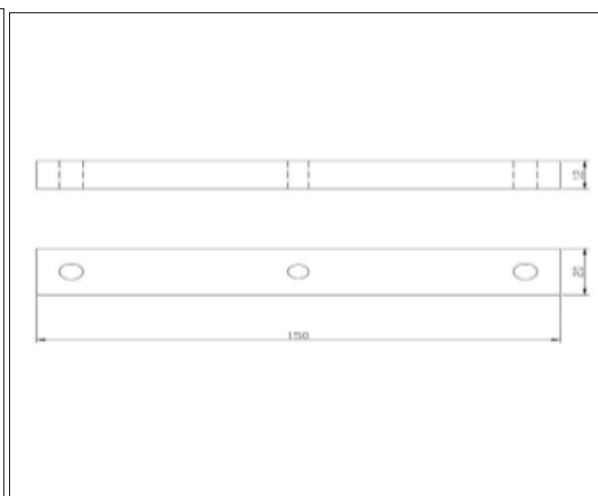


Fig 4. Design of Linner

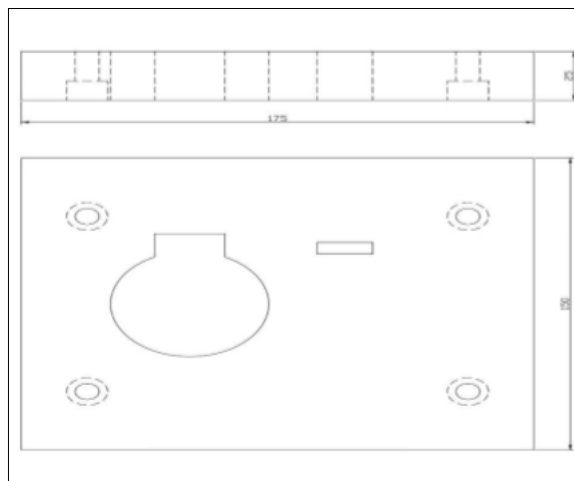


Fig 5. Design of Bottom Plate

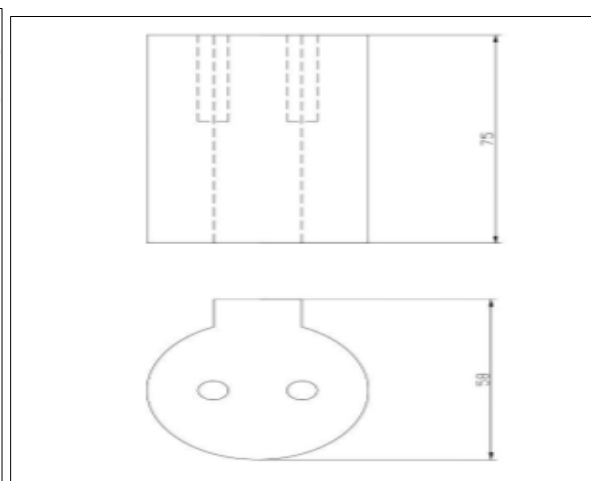


Fig 6. Design Of Final Punch

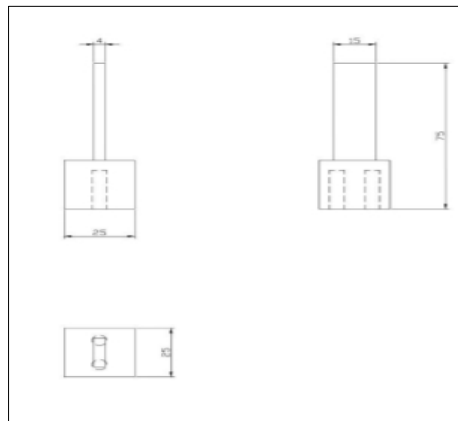


Fig 7. Design of Slotting Punch

4. FUNCTION

- Top plate: - To hold the punches via the use of the fasteners. Clamp the higher side of the die with the ram of the clicking gadget.
- Stepper plate :-To maintain the strip or the workpiece fabric on vertical direction. It works for the proper guidance for shifting the both the Punches.
- Liner Plate:-To maintain the strip with the aid of both the facet of horizontal route so the of the strip cannot alternate the position at the time of stroke.
- Die Plate: - Die plate has the major function within the press device. It having the sharp edges and assist to shear the work piece.
- Punches: - It also has the important function in the press device and because of its sharp edges it shear the workpiece correctly and grow to be giving the suitable nice of the workpiece.
- Bottom plate: - It's completed the feature of clamping the die of the downward aspect. All the issue of the die is holded on this plate

Sr. No.	Operation	M/C used	Setup Time (min)	Operation Time (min)	Total Time (min)
1.	Milling operation	DRO Milling	20 min (each plate)	25 Min (each plate)	45 Min (each plate)
2.	Rotary Grinding	Rotary Grinding m/c	10 min (each plate)	20 Min (each plate)	30 Min (each plate)
3.	Surface Grinding	Surface Grinding m/c	10 Min (each plate)	25 Min (each plate)	35 Min (each plate)
4.	Drilling Operation	Drilling m/c	15 Min (each plate)	30 Min (each plate)	45 Min (each plate)
5.	Wire cut Operation	Wire cut EDM m/c	25 Min (die plate & punch)	45 Min (die plate & punch)	70 Min (die plate & punch)
6.	VMC Machining	VMC m/c	35 Min (punch)	35 Min (punch)	70 Min (punch)
7.	Hardening Treatment	Furnace	5 Min (die plate & punches)	20 Min (die plate & punches)	25 Min (die plate & punches)

Operation Sheet Table

Purchase the raw material having the size of (150*175*25mm), (150*175*20mm) (80*75mm),(25*25*75mm).

Sizing the raw material according to design dimensions using the various machining processes. Performed the surface grinding operation to the top and bottom of the plate using the surface grinder machine.

Operation performed on the Dai plate and Stepper plate is on drilling machine and that operation is to make the hole to plate for the entry of the wire for the purpose of the wire cut machining.

Then we make the hole on various coordinate to the top plate and bottom plate for the purpose of the mounting the press tool die and holding the punch.

We are performing the two operations at the single time so we need the two punches in this step we did the machining the wire cut operation for the first punch and perform the VMC machining for the second punch. We performed this machining operation according to the shape and the accuracy of the workpiece. We performed the operation of the drilling on both the punches for the mounting on the top plate.

Then the special treatment of the hardening is given to the both the punches and the die plate. Performed the surface grinding operation to the both the punches and the die plate by using the surface grinding machine. Then assembled the press tool die using the fasteners.

5. RESULTS AND DISCUSSION



Fig 1. Plates



Fig 2. Punch and PU Bush



Fig 3. Embossing Punch



Fig 4. Assembly of all



Fig 5. Final Embossing Punch

6. CONCLUSION

Design of press tool for Piercing and notching made for sheet steel thing (plate) has been advanced by way of following the fundamental die layout standards. The press tonnage required for the operation is above the capability of the machine which exists. So it is required to apply some force discount technique so that it's far appropriate for its current press ton machine. Moreover the geometrical compatibility of the mechanical press and the designed blended press device is tremendous. The gear normally made from metallic alloys. Based on carbon composition they are labeled in P type, D kind, H type. Of all D type is having greater carbon percent which indirectly possess greater energy. They are in particular used for making of device'

7. REFERENCES

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