

**CHAPTER 6**  
**MANUAL INSTRUCTION**

This manual instruction explains the list of specifications and the operating procedure of spin casting machine.

**6.1. Machine Specification**

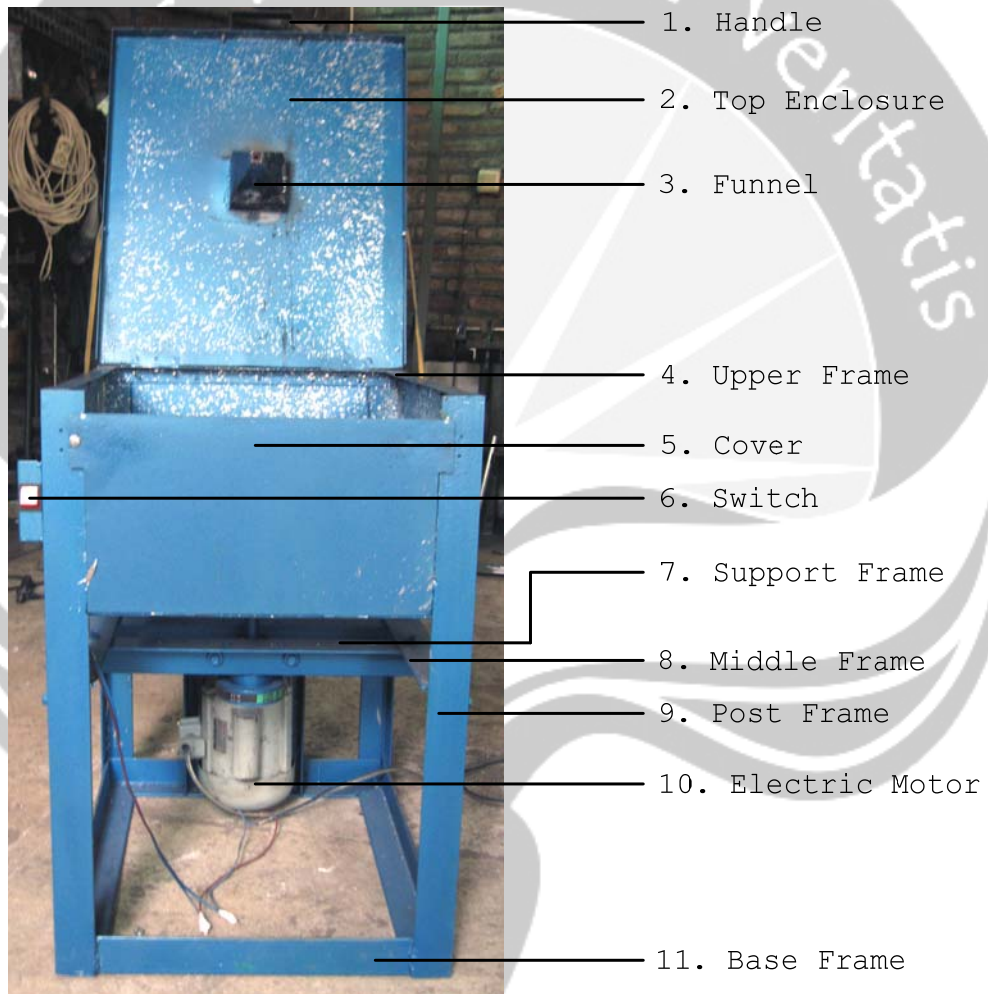


Figure 6.1 Machine Specification

Table 6.1 Specification

<b>SPECIFICATION</b>	
Dimension	520mm x 440mm x 710mm
Weight	55 kg
Maximum speed	1400 RPM
Operating speed	460 RPM
Maximum dimension of silicone rubber mold	140mm x 600mm
<b>POWER SUPPLY</b>	
Input voltage	220V AC, 50/60Hz
Power Consumption	187.5 Watt
<b>PRICE</b>	
Master Model Machine	IDR 4.500.000,00

## **6.2. The Operating Procedure**

### **STEP 1: Prepare Tools and Material**

1. Molten metal
2. Silicone Rubber Mold
3. Ladle

### **STEP 2: Open Top Enclosure**



Figure 6.2 Open Top Enclosure

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**STEP 3: Load silicone rubber mold into plate**

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Figure 6.3 Load silicone rubber

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**STEP 4: Put and fasten the mold frame gripper to plate**

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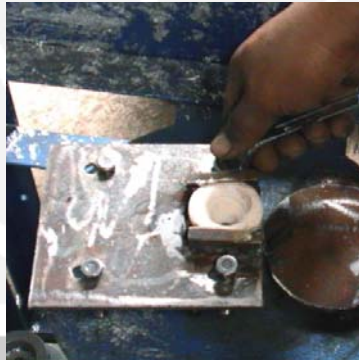


Figure 6.4 Fasten the mold frame

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**STEP 5: Close Top Enclosure**

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Figure 6.5 Close top Enclosure

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**STEP 6: Connect Machine to Regulator**

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Figure 6.6 Connect machine to regulator

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**STEP 7: Plug Regulator's Electrical Plug to the Jack**

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Figure 6.7 Plug the electrical plug

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**STEP 8: Activate the machine**

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Figure 6.8 Turn the switch on

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Figure 6.9 Set the regulator at maximum voltage to activate electric motor

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Figure 6.10 Set the regulator at 125 volt to get constant speed

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**STEP 8: Pour the molten metal to the Funnel Presser and wait for spinning process about 1 minute**

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Figure 6.11 Pour the molten metal

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**STEP 9: Turn off the regulator**

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Figure 6.12 Set the regulator at 0 volt

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Figure 6.13 Pull the plug out

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Figure 6.14 Turn the switch off

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**STEP 10: Open top enclosure**

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Figure 6.15 Open top enclosure

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**STEP 11: Remove mold frame to unload silicone rubber mold**

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6.16 Remove mold frame

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**STEP 12: Open silicone rubber mold to obtain casting result**

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Figure 6.17 Open silicone rubber mold

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**CHAPTER 7**

**CONCLUSION**

**7.1 Conclusion**

From the research, conclusion obtained

1. The best technique in master model is using horizontal long sprue mold that spun using machine that the spin rate is controlled by regulator and the heating time of tin is no more than 4 minutes.

Table 7.1 Comparison Result

	Master	Making Master Model
Front Side		
Back Side		



2. a. Making master model production time :

One product will takes 4.2025 hours or half working day.

Low quantity order, 250 products take 7 working days.

b. Master machine cost is IDR 1.650,00

### **7.2 Suggestion**

For the future research, it is suggested to conduct a design mold frame which has different size to gain others different master model size.

## REFERENCES

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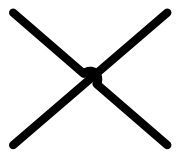


# APPENDIX

# PROCESS DECISION PROGRAM CHART (PDPC)

MAKING MASTER MODEL

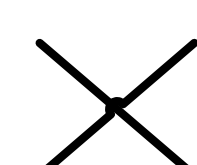
Using Roland MDX 40



Too Expensive because the machine utilizing per hour is expensive

By Casting

By Carving



The master model is too complicated, hand carving do not get the detail and also long time consuming

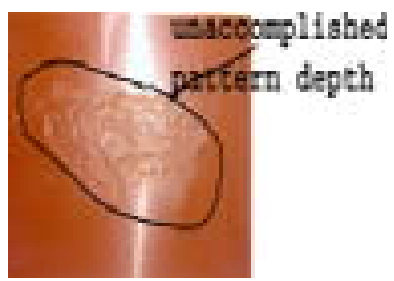
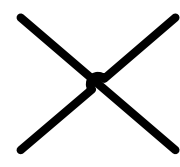
Using silicone rubber silicone seal

Preparing the silicone rubber

Preparing the Master Model (made by CNC)

Vulcanizing the Mold Frame

Bad Result (Unaccomplished pattern)



Using HTV silicone rubber

Preparing the silicone rubber

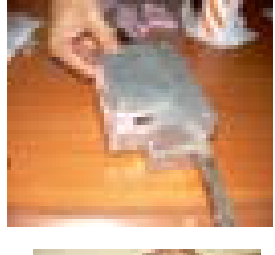
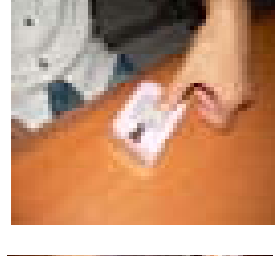
Preparing the Master Model (made by CNC)

Placing the Silicone and Master Model into the Mold Frame

Vulcanizing the Mold Frame

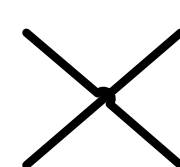
Open the Mold

Mold Finished



Using RTV silicone rubber

Blow Defects



Cast with Resin

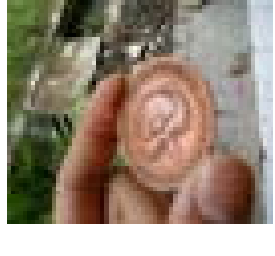
Pour resin into the mold



Obtain the product

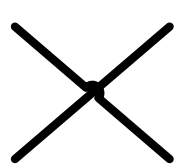


Electropated the Resin Product

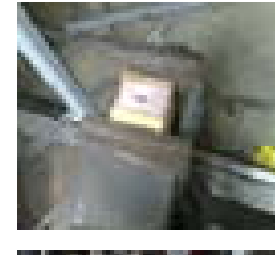


Vulcanized Electroplated Product

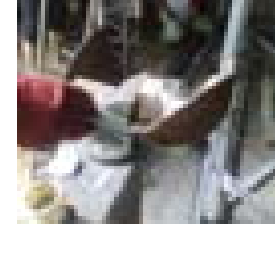
The broken Mold



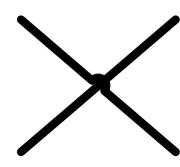
Using Bench Vise



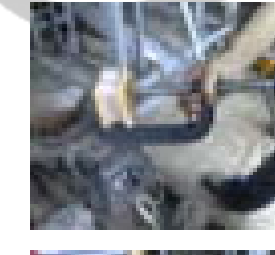
Pouring the tin



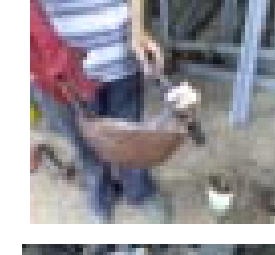
Blow defects on result



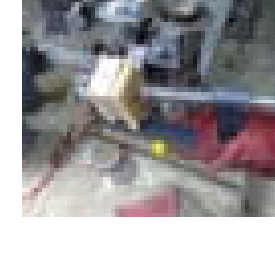
C-clamp and shaking



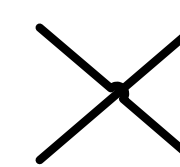
Pouring the tin



Shaking the mold



Blow defects on result



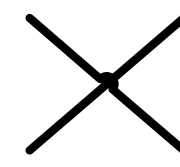
Cast with Tin

Heating the mold



Pouring the tin

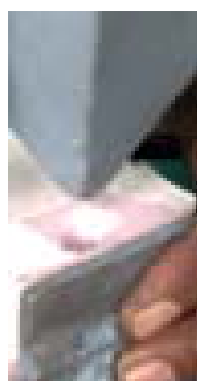
Blow and pin holes defects



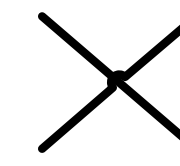
Spin Method using master model machine



Vertical Mold Casting



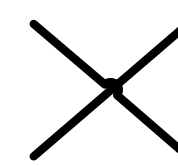
Blow Defects on the product



Horizontal Mold Casting



Cold shut defect



Spin Method using master model machine with regulator



Horizontal Long Sprue Mold Casting



OBTAIN THE MASTER MODEL

