

Note: Per Stroke Cost denoted here as “X” is calculated as per annual budget **2,61,27,360/- (Rs/Annum)** } allotted for press shop, which contains all expenditures like Utility (crane, fork lifter, cooling tower, transportation, DG, compressors, Lights/lamps etc.), Salaries/ Wages (operators, helpers, fork lifter driver, line leaders, engineers, press shop In charge, Production managers etc.), Power consumption charges, Machine cost, General Maintenance, tool maintenance (tools, nut bolts, Housekeeping, miscellaneous charges like lockers, safety shoes, safety goggles, hand gloves, aprons, uniforms, ear plug, stationary etc.)

$$\text{“X” (Rs/stroke)} = \frac{\text{Budget in Rs/min}}{\text{Target Stroke per min of the press}}$$

$$= \frac{50.4 \text{ (Rs/min)}}{6.3 \text{ (Strokes/min)}} = 8 \text{ /- (Rs/stroke)}$$

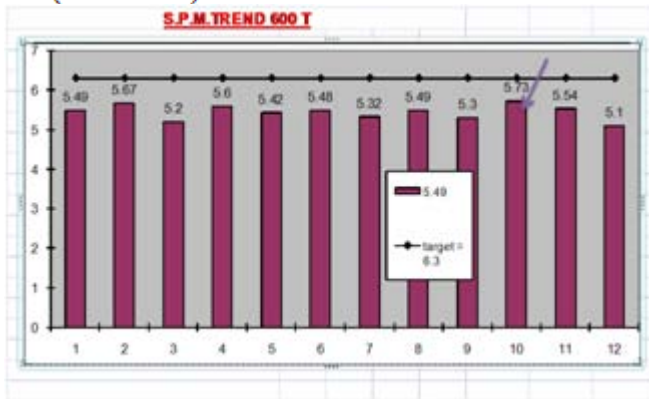


Figure 4.1: SPM trend refers to the number strokes per minute by any press machine in total available time

Description of figure 4.1

Y axis shows strokes per minute of 600 T mechanical press
 X axis shows no. of days
 Target SPM 6.3
 The maximum SPM at 10th day due to kaizen for productivity improvement
 As per the daily production report the production trend for the day for all press machines in press shop for the day.

The following observations of 600T mechanical press are:

- i) Number strokes for two shifts are **4992**
- ii) Number of die set up **04**
- iii) Strokes per minute is **5.74**
- iv) O.E.E is **90.21**

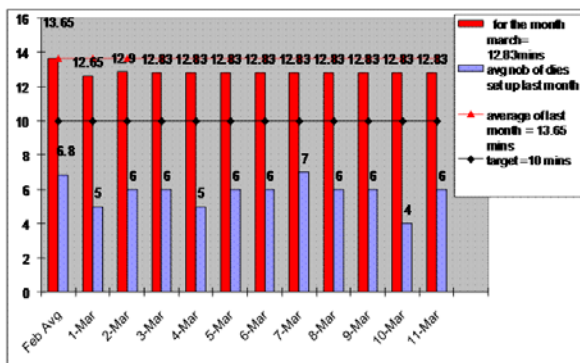


Figure 4.2: Die changing time refers to the average time taken for total die change in a day on a press machine.

Description of figure 4.3

Y red bars shows time taken during die change & blue bars shows no. of die change.
 X axis shows no. of days
 Minimum die change on 10th day due to Kaizen for productivity improvement.
 Target die change time is 10 min

4.1.3 Calculations

Machine specifications

Type: Pneumatic Press
 Bolster size 1450 x 2210 mm²
 Tonnage= 600T
 Efficiency = 80%
 Stroke length =2260mm
 Shut height = 450mm
 Die Specifications as per operation standard

Operation 2/4 (Trimming)

Die size =530 x 840 mm²
 Height of die = 630mm
 Manpower required = 04
 Weight of Upper half of die =110.5 kgf
 Approved Cost for operation at 600T = Rs 8/stroke

Operation 3/4 (punching)

Die size =560 x 810 mm²
 Height of die = 610mm
 No of packing plates required of thickness 5mm = 04
 Weight of upper half of die after packing plates = 110.5kg
 Manpower required = 04
 Approved Cost for operation at 600T = Rs 8/stroke

Procedure

“Operation cost is indicated here as number as production strokes of the press machine”

- (A) Operation cost = approved per stroke cost x annual requirement of parts = 8 x 22000 = **1, 76,000/-**
 Standard die change time is the time taken during removing of previous operation die and uploading next operation die on bolster.
 Standard die changing time = 10 mins
 Annual saving in standard die change time(SDCT) = (annual production/lot size)xSDCT
 = (22000/1000)x10min = **220mins**
 Standard SPM of 600T Machine = 6.3 strokes/min
 Annual increment in production strokes as per standard SPM of 600T Machine = Annual savings in SDCT x Standard SPM of 600T Machine = 220x6.3 = 1386 production strokes
- (B) Annual improvement in production cost= productions strokes x standard costing of M/c = 1386x8 = **11088/-**
 Total savings in VAVE = (A) + (B) = 176000+11088 = **187088/-**

5. Conclusion & Discussion

5.1 Conclusions of the Work

This paper is based on analysis and finding various opportunities, where any organization can reduce the unwanted cost. Following are the conclusions:

- 1) The paper is based on cost reduction techniques at supplier end for reduce overall cost of the final product & also contributes to improve in value of the product. The study is conducted in press shop of an automotive stamping part supplier unit, to check the scope in productivity improvement, scrap utilization on the concept of **lean manufacturing & Kaizen**, studied during this project. During the study, there are 300 types of press parts manufacturing in press shop as per bill of material (BOM).
- 2) There are following parameters of productivity improvement in 600T Mechanical Press

Table 5.1: Data Findings

SN	Factors	Findings	Previous
1	Strokes per minute SPM	5.74	5.67
2	Over all equipment efficiency OEE	90.21%	89.65% Average of month
3	No. of strokes	4992	4927 (Targeted for two working shifts)
4	Cost reduce per annum	187088/-	-

Dimensions, weight of die and tonnage requirement are selected from operation standard for productivity improvement. The part Reinforcement Cab stay LH/RH is having die is selecting for tool trial. After finding the ok part the die Operation no. 3/4 upper half is require to increase its height by **20mm**. The O.E.E. for the day FTD is **90.21%**, which is more than month till date MTD **89.65%**. The improved SPM (strokes per minute) of the **600 T** press machine for the day is **5.74** which is maximum SPM from last 09 days production. The die change is minimum for the day FTD is **04** and the no. of strokes for the day for two shifts are **4992**, which are higher than the target strokes per two shifts **4927**.

5.2 Limitation of Study

The study is based on standard value which are set by company on their past experience and analysis. There are many factors like, working environment, operator skill, manpower efficiency, machine performance and other miscellaneous factors are not considered. Cost reduction technique may vary for purpose of study, product, process, geometry, weight and material grade and fitment in vehicle.

This study excludes production losses because of low production dies, which have complex geometries and also cause accidents of operator during work.

The concept is checked during tool trials and final part is compared by the standard part, so if all parameters are ok during trial then only consider. This method is based on ideas comes in the mind during work in production. There

are some thumb rules, which can affect the results on the others parts.

5.3 Scope for Future Work

- This study is a specific study restricted to the case organization .A number of such studies can be done in variety of industries to reach at common conclusions, which can be generalist in nature.
- The interview sessions are conducted with different personnels to find out the cost reduction techniques which are used at their organizations. There are some more techniques, which can be used in the case organization like technical surveys, weighted score method, decision matrix etc.
- This study is conducted at the scale of middle level organization. It can be scale down at small scale industries and scale up for large scale industries.
- In this work, five interview sessions are conducted. The sample size can be increased up to 10, 15, 20, 30, 40 up to 50 for taking different opinions about cost reduction techniques.

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