

Investigation of good manufacturing practice for producing large batch components and feasibility of implementing various machines in a local SME.



Denis Murphy, Nathan O Byrne, Adam Merriman.



Aim of the Project

The aim of the project was to find the most cost effective way to produce large batch parts and to create a feasibility study.

Background

This project was in partner with Shannon precision Engineering who are a company that produce high quality parts for various industries. They are based in Shannon Co Clare. The project was undertaken to producer parts that would need to be polished and anodized. There are 2 process as to how this can be carried out.

The 2 Process

Process one	Process two
Raw aluminium unpolished and anodise	Aluminium is polished and anodised
Polished with a centreless grinder	Cut parts to size
Cut parts to size	Drill Holes
Drill Holes	Deburr
Debur	Dip ends in Alodine tank
Anodise Bath	Finished parts
Finished parts	

Figure 1: Process Steps

Limit waste

There was also the need to find out how much tube was going to be needed in order to cut the lengths. So a calculation was needed to be done as to find a way to limit the waste

There is also a cost for the running of the machine itself which takes in to account the electricity and there is also a labour cost need to move the parts around and to run the machine to make sure it runs smoothly.

Process Cost 1

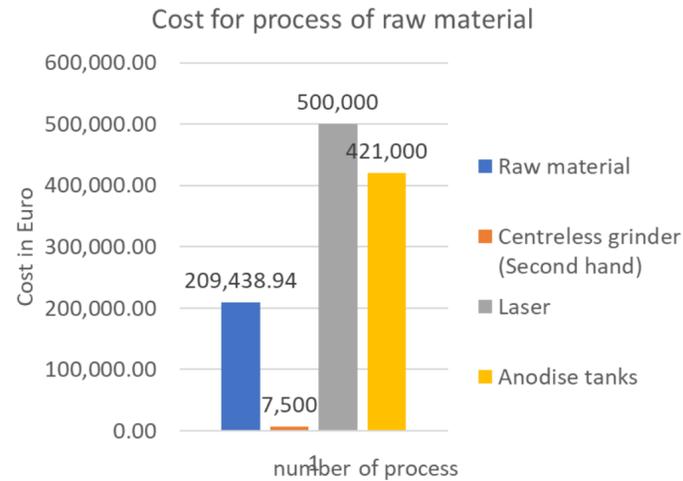


Figure 2: Graph of Process one cost

The cost for process one can be seen to have more steps. There are 3 main cost machines needed in this process as the need for an anodizing bath.

Additional Costings

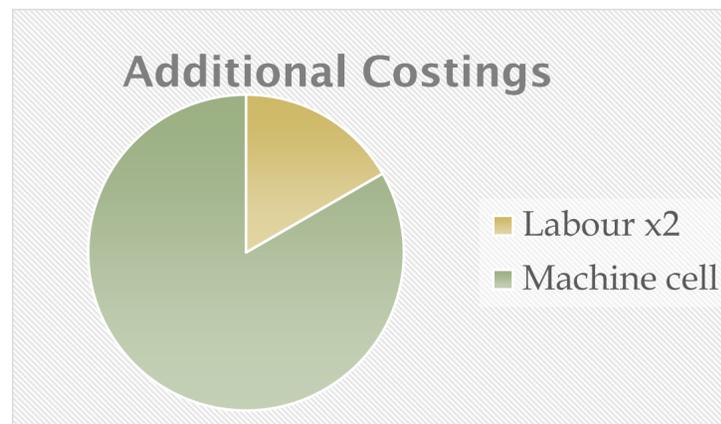


Figure5: Pie chart showing the extra cost

Process Cost 2

The cost for the process 2 can be seen below the cost for the material having most of the work done to it can be seen to be almost the same price as the laser cutter that is used to cut the parts up into the desired length from the 7.5-meter-long tube.



Figure 3: Graph of Process two cost

25.4

Total Amount of 7.5m Bars
1531 bars

Total Waste
229.501351 m

Efficiency
98%

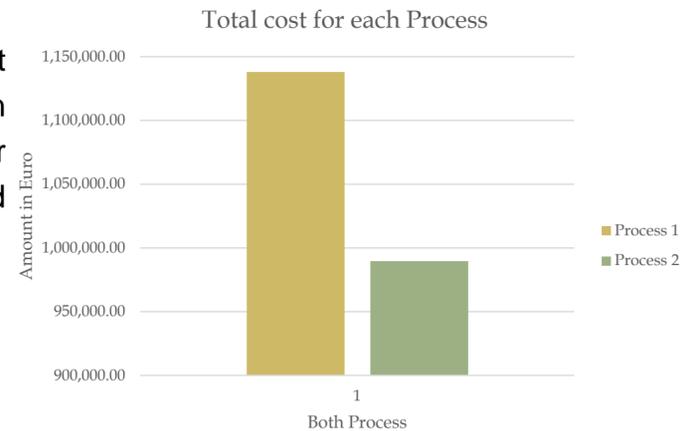


Figure 4: Graph of Final Costing for each process

From the findings the conclusion can be draw that process 2 is the best to produce the parts. This can be seen in the figure 2. As the difference is calculated to be €148,379.87. This is after 1 year as there is a big lay out for the baths in process one. But there still will be a cost of the acid needed to be put into bath for anodizing. Process 1 may be higher at the start but can be the most cost-effective way in a few years' time as the tanks may be rented out for the use to anodize parts for different companies as there as only a few companies in Ireland that do the anodizing. So Process 2 would be the best in short term as there is not a big outlay cost in compared to process one.

Acknowledgments

We would like to thank Shannon Precision Engineering for there responses to any of our questions and to Dr. Adrian Chaplin for his help and guidance throughout the project.

46.863

Total Amount of 7.5m bars used
1725 bars

Total Amount of Waste
75.015m

Efficiency
99.40%

50.8

Total Amount of 7.5m bars used
4047

Total Amount of Waste
2407.93

Efficiency
92.07%