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MEMORANDUM

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TO:

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SUBJECT: Benefit Analysis; Abano Machines Inc or Li Equipment Corp Shaft Machines

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Summary

The current equipment for line producing steel shafts is at its useful end at the Superior Cars Parts' Ellisville manufacturing facility. Abano machines is offering an equipment that can machine steel shafts of a mean diameter of 2.49 and a standard deviation of 0.030 and Li Equipment Corp offers a machine that produces steel shafts of a mean diameter of 2.53 and a standard deviation of 0.015. The requirements stipulate that the most acceptable dimension of the steel shafts is 2.5±0.05 inches in diameter with a diameter of 2.5 inches being ideal. An assessment of the two machine options was conducted based on the outcomes of 100 shafts. The aim of the assessment was to determine which vendor's machine produces near ideal shafts. After the assessment, the results indicated that Li Equipment Corp shaft making machine was the best choice for Superior Cars Parts Incorporated.

Analysis

On the challenge of identifying the best product, Li Equipment Corp's steel shaft stood out for its coefficient of variation. The assessment showed that the coefficient of variation for Abano machines is 1.20% and that of Li equipment is 0.59%. With a lower coefficient of variation, Li equipment corps' machine had the least variation making it highly likely to attain the ideal specifications, and produce more steel shafts within the acceptable range.
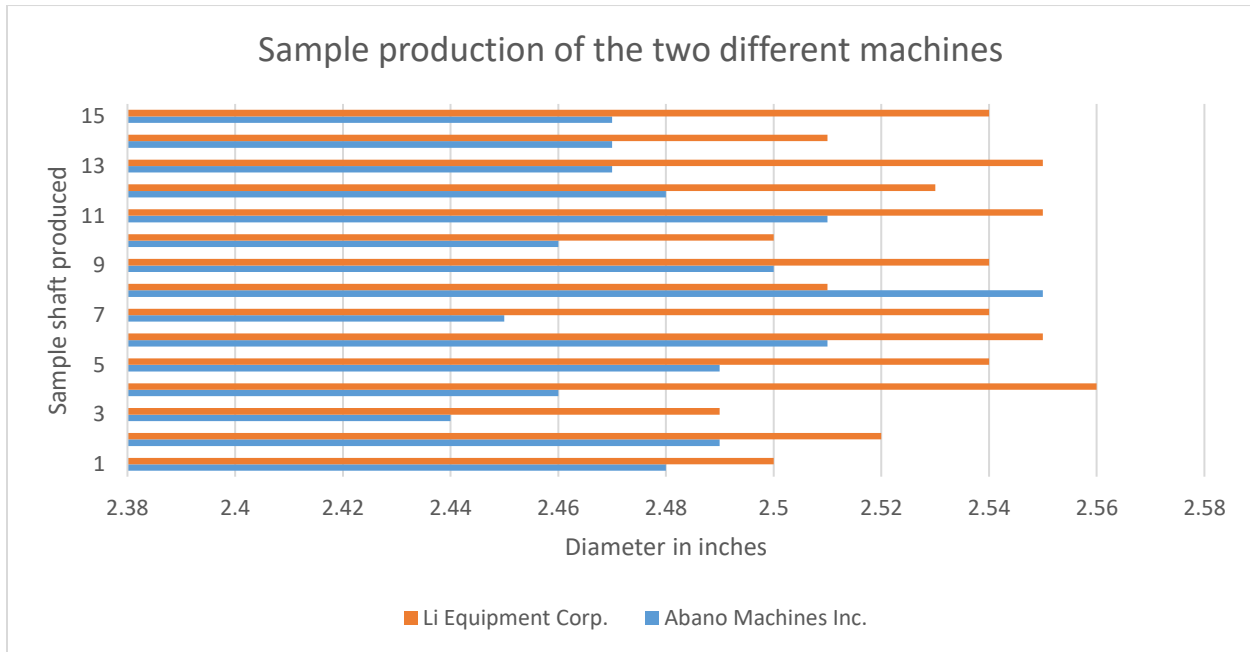
Graph

Figure 1 Sample Production for the Two Shaft Machines

The graph provides a pictorial representation that shows the values of 15 sample shafts made by both companies. As it can be observed from the graph, despite of the outliners, Li equipment corps values are closer to the ideal value as the lowest diameter is 2.49 and the highest is 2.56 compared to a low of 2.44 and a high of 2.55 by Abano machines. The low variation in Li equipment corps' values also points at a high efficiency rate.

Additional Considerations

It is imperative to consider the costs of running both machines and efficiency of both machines. While one machine can be highly effective in producing the shafts, high costs of operations can overwrite the benefits accrued from using the machines. Secondly, the lead time of production for both machines is critical in making the choice for the best machine. High efficiency couple with longer lead times can also overwrite the potential benefits of efficiency.

Conclusion

Superior Cars Parts' Ellisville manufacturing facility will be acquiring a new steel shaft making machine to replace the current equipment that is becoming obsolete. Abano Machines and Li Equipment Corps are offering the machines. An assessment conducted on the machines indicated that Li equipment Corps' machine was the best choice as it produced shafts of a near ideal diameter and had a lower coefficient of variation. It would be essential to factor in the time taken by both machines to understand better their efficiency.

Appendix A- Calculations

Given the dimensions of the shaft = 2.5±0.05

The range of the diameter is = 2.55, 2.45

Abano Machines Inc.

Limits= Mean ± 3 $\sqrt{\text{variance}}$

Given the mean = 2.49, SD= 0.030

Variance = (SD^2), =(0.030*0.030)

= 0.0009

=2.49± 3 $\sqrt{0.0009}$

= 2.58, 2.4

Coefficient of Variation = ($\sqrt{\text{variance}}$/ mean)* 100

= $\sqrt{0.0009}$/ 2.49 * 100

= 1.20%

Li Equipment Corp

Limits= Mean ± 3 $\sqrt{\text{variance}}$

Given the mean = 2.53, SD= 0.00150

Variance = (SD^2)

= 0.000225

=2.53± 3 $\sqrt{0.000225}$

= 2.575, 2.485

Coefficient of Variation = ($\sqrt{\text{variance}}$/ mean)* 100

= $\sqrt{0.000225}$/ 2.53 * 100

= 0.59%