URN etd-0407109-183724-2024
Author ALVIN WEI
Author's Email Address No Public.
Statistics This thesis had been viewed 38 times. Download 22 times.
Department
Year 2004
Semester 1
Degree Master
Type of Document Master's Thesis
Language zh-TW.Big5 Chinese
Title Optimum Design of Controlling Factors
-A Case Study on Manufacturing of Ultra-fine Wire
Date of Defense 0000-00-00
Page Count 96

Keyword
design of experiment
stainless wire
Taguchi quality engineering
respond surface method
die
process optimization
annealing

Abstract
The stainless steel market of high unit price, high additional value has been a key market of the global steel industry all the time, and the characteristic of the stainless steel can’t be substituted by other metal. Its anticorrosive performance is superior to the general metal. Even in the suitable high temperature, the intensity of the stainless steel will not be influenced. In recent years, because of the fine performance of the stainless steel, it has been widely used in daily life, such as on electronic product, automobile part, family electric apparatus, etc.. The application of the stainless steel can be regarded to gradually become more extensive upon important materials in a lot of industries. Currently, there is still no production in Taiwan that can offer finest stainless steel wire at a diameter of 20 microns (0.02mm). Right now the main source of its production is in Japan. If this research project can succeed in developing 20 microns finest stainless steel wire, then we can meet the demand from domestic downstream manufacturing industries. By doing so, we can be in the position to stay ahead in the global competition.

In this study we use the orthogonal array to design experiments and run the experiments in order to improve the drawing process of 20 microns of stainless steel wires. Taguchi methods are applied to analyze the experimental data. We expect to find out the key factors, level combinations, and the optimal values of the parameters for best effect in the production. Then, the respond surface method will be used which shows the quality characteristics within range of the key factors and assumed levels .Thereafter we can estimate the optimum parameters to optimize the response. Variation on the quality characteristics can be investigated by easily adjusting the deciding factors and levels to achieve best effect on the desired quality characteristics. Experiments shall be run to confirm our prediction. All the methods and procedures used in this research can be applied in the production process at Yuen Neng Co. Ltd., Hopefully, the outcome of this research can be referred as a guiding light in the company which leads us to obtain superior production technology. Then, we will be able to raise our competition capability and keep our operation moving on a firm basis.
Advisory Committee - advisor

Files etd-0407109-183724-2024-001.pdf

indicate access worldwide
Date of Submission 2005-08-03