We thank the Reviewer for their constructive criticism and suggestions for improving the paper. We have found them very useful and we have implemented changes and clarifications in the revised manuscript accordingly. All new or modified text in the revised manuscript has been highlighted using red colour. Below is our detailed response to the reviewers' comments:

Comment 1. What is the most important innovation of this article?

Response 1: There were several innovations in this article that have not been published in the literature:

1) The analysis of the effects of the initial surface texture on the polishing ratio and final roughness.

2) Assessment of the effect of the five EP parameters on dimensional accuracy and electrical consumption cost.

3) Cross-checking the effects of the EP parameters on polishing rate, dimensional accuracy and cost by overlaid contour plots, and analysing their global behaviour.

4) And multi-objective optimisation of electropolishing conditions for this material.

All these aspects are new and innovative, and have not been published in the literature, and are of considerable interest to researchers and the manufacturing industry.

Comment 2. Authors should provide explanations for each of the refences given in the introduction section

Response 2: The manuscript has been modified according to the Reviewer's suggestion. All references have been separated, and cited in a single aspect of the introduction for better comprehension. The length of the introductory section has been reduced. The basic electropolishing literature has been removed from the introduction to focus on the most relevant studies related to our manuscript.

Comment 3. What was the reason for using the response surface method compared to other design of experiment methods?

Response 3: The response surface method (RSM) is an appropriate method for designing experiments when the variables under study are homogeneous and exhibit a linear behaviour. All polynomials regression models analysed in this study reached high experimental data fit with second order models. Thus, RSM was an ideal tool for obtaining the correlation of the electropolishing parameter with the surface quality and dimensional accuracy of the electropolished parts. This method allowed for the analysis and interpretation of the collected data in the experimental test in a simple way with good results, so it was not necessary to explore more complex methods for designing the experiments.

Comment 4. How are the upper and lower limits provided for each parameter determined? Did the authors use the trial and error method, or did the selection of the parameter range have another scientific basis?

Response 4: Electrolyte temperature, initial surface roughness, and electropolishing time limits were selected according to previous studies published in the field of electropolishing stainless steel [1-3], and in the previous works of the authors of this manuscript. Current density limits were selected using the maximum and the minimum ranges of the electropolishing cell, and according to previous published studies [1-3].

[1] Fedot'ev, N.P., G.S.Y. Electropolishing, Anodizing and Electrolytic Pickling of Metals; Draper, R.L. t. d., Ed.; 1960; ISBN 0852180012/ 978-0852180013.

[2] Han, W.; Fang, F. Fundamental Aspects and Recent Developments in Electropolishing. International Journal of Machine Tools and Manufacture 2019.

[3] Łyczkowska-Widłak, E.; Lochyński, P.; Nawrat, G. Electrochemical Polishing of Austenitic Stainless Steels. Materials 2020, Vol. 13, Page 2557 2020, 13, 2557, doi:10.3390/MA13112557.

Comment 5. The interpretations provided for the parameter interactions results are very incomplete and require more complete explanation.

Response 5: The manuscript has been modified according to the Reviewer's suggestion. The suggested modifications have been made and included in the review of the manuscript. New ANOVA analysis (Tables 4, 6, 7, 9, 10, and 12) have been introduced with the sum of squares type III and the p-values of the EP parameter interactions. The text explaining the interaction of the parameters current density and electropolishing time in the manuscript has been modified.

Comment 6. Why did the authors not use methods such as Sobol sensitivity analysis?

Response 6: In the ANOVA analysis performed in section 3.1, the effect of each electropolishing parameter on the variance of the response variable (Ra) was quantified by the Type III sum of squares. This parameter provides similar information as the "Sobol indices", indicating the effect of the EP factor analysed on the output variable (response variable).

Comment 7. How have the efficiency and performance of regression equations been investigated?

Response 7: The efficiency and performance models were evaluated according to the parameter adjusted determination coefficient R^2_{adj} (adjusted R-squared), with only the highest adjusted R-squared being selected, and prioritizing models with the least number of variables (Principle of Parsimony), and the unbiased models with Mallows coefficient of $C_p = p$, where $p = n + 1$, with *p* being the number of model parameters that was equivalent to the number of variables *n* plus the constant. All of the models obtained in this paper were diagnosed using residual analysis, all models exhibited normality in the residue distribution, no significant tendencies in the residual versus fitted value plot, or residual versus observation order plot were observed in any of the models. This information is included in section 3.2.