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English Editing (/user/pre_english_article/status)	Journal	<i>Journal of Manufacturing and Materials Processing</i> (https://www.mdpi.com/journal/jmp)
Discount Vouchers (/user/discount_voucher)	Volume	7
Invoices (/user/invoices)	Issue	1
LaTeX Word Count (/user/get/latex_word_count)	Topic	Welding and Joining of Materials in Off-shore and Energy Industry (https://www.mdpi.com/topics/welding_joining_materials_industry)
	Abstract	A grey-based Taguchi method was applied to investigate the optimal operating conditions in shielded metal arc welding (SMAW) to join SS316 and ASTM A36. This work aims to set optimal parameters for the mechanical properties of the weld joint. The effects of various welding factors on electrode type, welding current, arc welding, and welding speed have to be characterized and optimized to achieve an optimum condition. An L9 orthogonal array was used to group the various components. The mechanical properties of a dissimilar weld joints were described through hardness, tensile and flexural strength tests. The optimum welding parameters were obtained simultaneously as an electrode type E309, a welding current of 100 A, an arc voltage of 14 V, and a welding speed of 4 cm/min, which predicted improve 23.0% in its performance.
	Keywords	dissimilar weld; SMAW; SS315; low-carbon steel; Taguchi method; grey relational analysis (GRA); ANOVA

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Word Count	5667
Page Count	16
Figure Count	9
Table Count	14
Reference Count	33

## Editor Decision

Decision	Accept in current form
Comments	Dear Authors, Thank you very much for the changes in the manuscript content and all the replies. We support the decision to publish your work. Best regards, Topic editors
Decision Date	26 January 2023



## Review Report

Reviewer 1	Review Report (Round 1) (/user/manuscripts/review/34342838?report=25687456) Review Report (Round 2) (/user/manuscripts/review/34342838?report=26502361) Review Report (Round 3) (/user/manuscripts/review/34342838?report=26724213)
Reviewer 2	Review Report (Round 1) (/user/manuscripts/review/34374261?report=25684549) Review Report (Round 2) (/user/manuscripts/review/34374261?report=26502349)
Reviewer 3	Review Report (Round 1) (/user/manuscripts/review/34504562?report=25782297)

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Sepe, R.; Giannella, V.; Greco, A.; De Luca, A. FEM Simulation and Experimental Tests on the SMAW Welding of a Dissimilar T-Joint. *Metals* **2021**, *11*, 1016. doi: 10.3390/met11071016 (<https://doi.org/10.3390/met11071016>)

Ahmed, M.M.Z.; Touileb, K.; El-Sayed Seleman, M.M.; Albaijan, I.; Habba, M.I.A. Bobbin Tool Friction Stir Welding of Aluminum: Parameters Optimization Using Taguchi Experimental Design. *Materials* **2022**, *15*, 2771. doi: 10.3390/ma15082771 (<https://doi.org/10.3390/ma15082771>)

Devaraj, J.; Ziout, A.; Qudeiri, J.E.A. Grey-Based Taguchi Multiobjective Optimization and Artificial Intelligence-Based Prediction of Dissimilar Gas Metal Arc Welding Process Performance. *Metals* **2021**, *11*, 1858. doi: 10.3390/met11111858 (<https://doi.org/10.3390/met11111858>)

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Journal name: Journal of Manufacturing and Materials Processing  
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 Type of manuscript: Article  
 Title: Investigation of Welding Parameters Dissimilar Weld of SS316 and Low-Carbon Steel Joint Using Grey-Based Taguchi Optimization Approach  
 Authors: Diah Kusuma Pratiwi, Amir Arifin \*, Gunawan -, Alim Mardhi, Afriasnyah -  
 Received: 17 December 2022  
 E-mails: [pratiwidiahkusuma@ft.unsri.ac.id](mailto:pratiwidiahkusuma@ft.unsri.ac.id), [amir@unsri.ac.id](mailto:amir@unsri.ac.id), [gunawan@unsri.ac.id](mailto:gunawan@unsri.ac.id), [alim005@brin.go.id](mailto:alim005@brin.go.id), [afriansyah.perta@gmail.com](mailto:afriansyah.perta@gmail.com)

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## Part 1.

### Table respond to reviewer 1 comments

No.	Comments	Respond
1.	the title requires correction - one steel is given by name, the other from the material group & it suggests that only the weld metal is analyzed and not the entire welded joint	Line 2: We modified the tittle to "Investigation of Welding Parameters Dissimilar Weld of SS316 and ASTM A36 Joint Using Grey-Based Taguchi Optimization Approach".
2.	affiliations should be included in accordance with the guidelines of the journal	Line 8: the affiliation at line 8 we changed the sentence to "Research Centre For Nuclear Reactor Technology, National Research and Innovation Agency, 15314, Tangerang Selatan, Banten, Indonesia".
3.	what does keyword "2" refer to (line 19)?	Line 21: We removed keyword "2" (typo error).
4.	specify the proper names of the processes to be listed (lines 28-29, 53)	Line 28-30, 55: We improved the name into "shielded metal arc welding (SMAW), submerged arc welding (SAW), gas metal arc welding (GMAW), gas tungsten arc welding (GTAW)".
5.	some units given as abbreviation, as the whole name, some in brackets, some without brackets (line 51-60) - please standardize	Line 53-62: We have improved the sentence refer to suggestion
6.	line 60: is "for joining A2205 dan SS316L", should be "for joining A2205 and SS316L"	Line 62: We have improved the sentence refer to suggestion.
7.	the materials and method chapter should be structured as in the title - first a description of the research material, and then the methodology (including the Taguchi method).	Line 84-105: We have re-arranged the sentence structure
8.	line 102: what method was used to analyze the chemical composition?	Line 85-86: The chemical composition of base materials is shown in Table 1 characterized by using PDQ-XRF automated X-ray fluorescence elemental analysis

No.	Comments	Respond
9.	SMAW welding is characterized by high variability of parameters during welding. Are the parameters given in Table 2 the assumed values or the average values recorded during the experiment?	Line 126: The parameters were chosen based on common practical welding parameters and available equipment setting.
10.	what are the static characteristics of the device used for the experiment? Steady current or dropping? This has a significant impact on the actual value of the current, independent or dependent on the voltage = arc length.	Welding process involve a steady stream of electricity; thus, the current is held at a constant 90, 100, or 110 A.
11.	line 115: values instead of velues	Line 133: We have improved the word refer to suggestion.
12.	line 119: necessary superscript at degrees, angle instead of angel	Line 96: We have improved the word refer to suggestion.
13.	lines 123-127 - specify the name and manufacturer of the testing machine, hardness tester and metallographic (light) microscope	Line 103-104: Brinell hardness BH-3CF Type from Tokyo testing machine MFG.co.ltd, and Olympus STM6-LM optical microscope
14.	first, a general view of the joints (Fig. 2) should be presented, and then the results of the RT tests (Fig.1). Figure 2 is not mentioned anywhere in the text.	Line 173-176: The sentence and figure has been repositioned refer to recommendations.
15.	line 190: the table is number 1 when it should be 4	Line 196: Table 1 has been changed to Table 4
16.	lines 186, 190: hardness markings do not match - should be HBW	Line 192: hardness markings changed to HBW
17.	line 209: drawings are blurry (fig 3, fig 4, fig 5, fig 6, fig 7)	line 206: We improved the figures quality

No.	Comments	Respond
18.	line 229: information about the testing machine is redundant here	Line 225: We have improved the sentence refer to a suggestion .
19.	line 305: Figure 6 instead of 2	line 273: Figure 2 has been changed to Figure 6
20.	line 406: table 14 instead of 12	Line 374: Table 12 has been changed to Table 14
21.	The content of section 3.6 Microstructure evaluation is microstructure prediction, not its evaluation-observation. How was the sample prepared for observation? How was it prepared, how was it digested? There is no scale mark in Fig. 8	Standard metallographic analysis procedure used to observe microstructure of weld. This procedure involves preparing a metal sample by carefully polishing and etching, and then examining the surface under a microscope.  Furthermore, the microstructure analysis has been elaborated on the line to 404.
22.	lines 412, 435, 451, 457: figure 7 instead of 3.	Line 381, 391, 397, 403 : We have improved the number refer to suggestion.



**Part 2.**

**Revised manuscripts**

# Response to Reviewer 1 Comments

**Point 1:** line 85-86: complete device details (model, manufacturer)

**Response 1:** Please provide your response for Point 1. (in red)

**Point 2:** comment 9,10: the Vantage 500 Deutz operates as a CC (constant current), which makes the indication of the amperage understandable. Welding speed can be measured by knowing the welding time and weld length. How was the voltage determined? It is impossible to maintain a constant arc length throughout the process.

**Response 2:** Thank you very much for your comment, The arc length is the distance between the welding nozzle and the material to be welded. With a shorter arc length, there will be sufficient shield gas around the weld, but there will be more spatter on the nozzle. A longer arc, on the other hand, results in less shield gas surrounding your weld, a weaker weld, and a great deal of spattering on the wire.

When welding, you should aim for the correct arc length to avoid creating a mess. Humans are fallible, yet performing a clean work can preserve your reputation as a welder. Mastering the ability to maintain the correct arc length requires years of practice.

Arc length can vary for a variety of reasons, but the average variation is approximately 0.1 inches. Some welders recommend keeping the length of the tip between 1/4 and 3/8 inches. Others claim that this is too far and could lead to a weak arc and an ugly weld. therefore in this study we used certified welder and radiographic testing to ensure the quality of the weld

**Point 3:** Olympus STM6-LM is not an optical microscope - as the abbreviation from the name indicates LM = light microscope.

complete device details (manufacturer)


**Response 3:** Thank you very much for your comment. we have improved the details of the microscope.

**Point 4:** "an austenite phase is formed due to the chromium (Cr) element" - this notation is misleading that chromium is an austenite former

**Response 4:** Thank you for correcting our sentence. we have modified the sentence to prevent misleading.

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Logout (/user/logout)	Authors	Diah Kusuma Pratiwi , Amir Arifin * , Gunawan - , Alim Mardhi , Afriasyah -
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Author's Notes

Dear Reviewer,

On behalf of all the authors of this paper I would like to thank you very much for your comments and suggestions to improve of this manuscript, we recognize that there are many mistakes in the writing of the manuscript. On this opportunity we have tried to respond to all the comments you gave which we put in the response table.

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We also attach the revised manuscript to clarify the revisions we have made.

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Comments and Suggestions for Authors

Thank you for submitting your manuscript. You can find my comments below:

1. the title requires correction - one steel is given by name, the other from the material group & it suggests that only the weld metal is analyzed and not the entire welded joint
2. affiliations should be included in accordance with the guidelines of the journal
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22. lines 412, 435, 451, 457: figure 7 instead of 3.



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Logout (/user/logout)	Authors	Diah Kusuma Pratiwi , Amir Arifin * , Gunawan - , Alim Mardhi , Afriasyah -
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Author's Notes Dear reviewer,

On behalf of all the authors of this paper I would like to thank you very much for your comments and suggestions to improve of this manuscript, we recognize that there are many mistakes in the writing of the manuscript. On this opportunity we have tried to respond to all the comments you gave which we put in the response table.



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We also attach the revised manuscript to clarify the revisions that we have made.

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Are the results clearly presented?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Are the conclusions supported by the results?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Comments and Suggestions for Authors

Hi, authors,

Please accept my apology for not replying in time.

My comments are as follows:

This paper used experiments and Grey-Based Taguchi method to achieve optimal parameters for the mechanical properties of the dissimilar weld joint based on the orthogonal array method. This is an innovative test method but the following problems still exist:



1. Some paragraphs in the Introduction can be described in more concise language, and pay more attention to the logic.

2. Page2, line52, "join" should be corrected to "joint".

3. Page3, table2, what is the reference for selecting the factors shown in the table? Is there a comparison between a wider range of materials and parameters?

4. Page5, line169, the first letter of "Penetration" should be lowercase.

5. Page5, line177 and page6, line190, Table 1 has been used and is inconsistent with Table 1 above. It should be corrected to Table 4.

6. Page8, line245, the position of the line mark is inappropriate, and the line mark of 246-257 lines is missing.

7. Page8, line259 to line272, the content in these two paragraphs correspond to the data in Table 6, but this is not explained.

8. Page9, line305, the number of this figure should be 6.

9. Page12, line370, what are the meanings of  $F(1.ne)$ ,  $V_e$  and  $N_e$ ?

10. Page12, line385 to line392, the position of these line marks is inappropriate.

11. Page13, line402 and line406, Table 12 has been used and is inconsistent with Table 12 above. It should be corrected to Table 14.

12. Page13, line411 and line435, Figure 3 has been used and is inconsistent with Figure 3 above. It should be corrected to Figure 7.

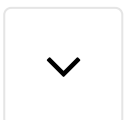
13. Page13, line413 to line434, the position of these line marks is inappropriate.

14. Page14, line451 and line457, the figure numbers should be 7b and 7c.

15. Page14, line457, it should be specified here that the corresponding figure is Figure 8.

16. In Materials and Methods, is there a difference between  $Y$  in equations (1) (2) and (3)? Especially in equation (3), should be separated by subscripts.

17. Table1 "carbon steel" should be changed as "A36".



18. In Results and Discussion, Fig. 2 should enlarge the details and indicate the location of the defect to facilitate the correspondence with Fig. 1. And it should also identify the two materials, in addition to improving the clarity of the article.

19. In Results and Discussion, some materials look rusty on the surface in Fig. 2, whether it will affect the welding quality?

20. The occurrence of defects, such as failure to fuse, should indicate the cause of the experiment, rather than the general factor.

21. The Flexural strength method should be illustrated graphically.

22. In Table 8, the Flexural strength of sample1 may incorrect, it should be 1.0000.

23. Deviation sequences of Flexural strength of sample1 in Table 8 is 0.0000, the accuracy of this data is worth considering.

24. This work aims to set optimal parameters for the mechanical properties of the weld joint. Therefore, the advantages of this experimental parameter should be explained by comparing the experimental results of others.


25. The pictures in the article should be improved in clarity. Some pictures lack rulers.

Submission Date	17 December 2022
Date of this review	04 Jan 2023 16:09:24



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Logout (/user/logout)	Authors	Diah Kusuma Pratiwi , Amir Arifin * , Gunawan - , Alim Mardhi , Afriasyah -
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Submit Manuscript (/user/manuscripts/upload)	Abstract	Grey-Based Taguchi method was applied to investigate the optimal operating conditions in the Shielded metal arc welding (SMAW) to join SS316 and low-carbon steel. This work aims to set optimal parameters for the mechanical properties of the weld joint. The effects of various welding factors on electrode type, welding current, arc welding, and welding speed have to be characterized and optimized to achieve an optimum condition. An L9 orthogonal array was used to group the various components. Mechanical properties of dissimilar weld joints were described through hardness, tensile and flexural strength tests. Optimum welding parameters simultaneously were obtained at electrode type E309, welding current of 100A, arc voltage of 14V, and welding speed of 4 cm/min which predicted improve 23.0% in its performance.
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LaTeX Word Count (/user/get/latex_word_count)	<b>Authors' Responses to Reviewer's Comments (Reviewer 3)</b>	

Author's Notes

Dear reviewer,

On behalf of all the authors of this paper I would like to thank you very much for your comments and support of this manuscript.

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## Review Report Form

- Quality of English Language
- English very difficult to understand/incomprehensible
  - Extensive editing of English language and style required
  - Moderate English changes required
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  - I am not qualified to assess the quality of English in this paper

	Yes	Can be improved	Must be improved	Not applicable
Does the introduction provide sufficient background and include all relevant references?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Are all the cited references relevant to the research?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Is the research design appropriate?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Are the methods adequately described?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Are the results clearly presented?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Are the conclusions supported by the results?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Comments and Suggestions for Authors

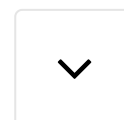
Good work and the current version can be accepted.

Submission Date

17 December 2022

Date of this review

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