cbecimat26
26° Congresso Brasileiro de Engenharia e Ciência dos Materiais
Costão do Santinho - Florianópolis/SC

Impacts of Friction Stir Welding (FSW) on the Precipitates of the AA5052-H32 Alloy

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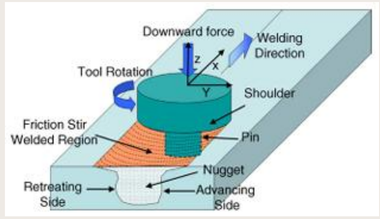
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Why This Material?

Automotive Industries

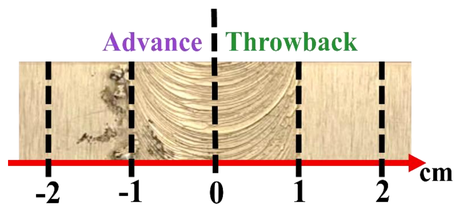
Reduce Weight

Weld with Steel - FSW



Experimental Approach





Grains Revealing
2,38 vol.% HBF_4
25 V per 45 seconds

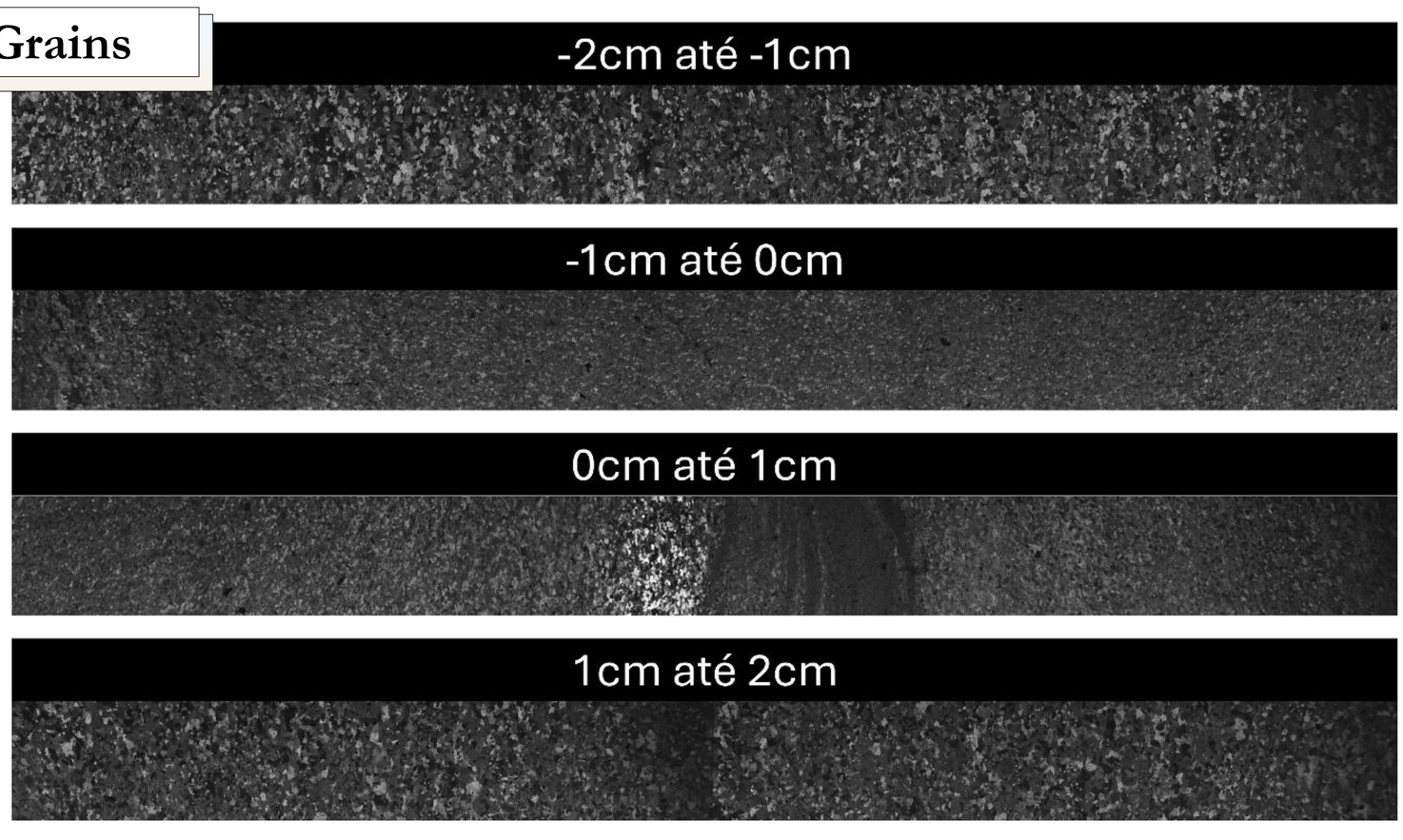
Observation
OM
SEM - EDS

Hardness
Vickers

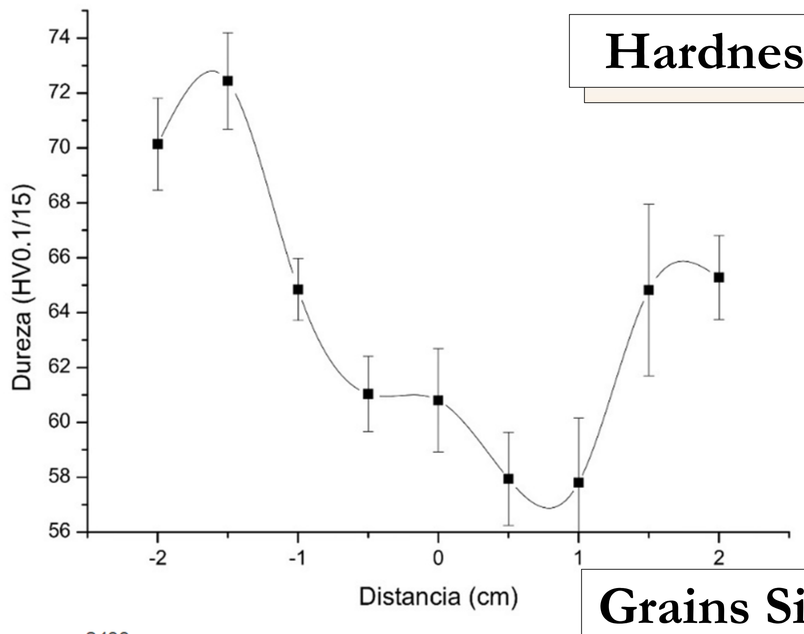
Particle Size
ImageJ

Results

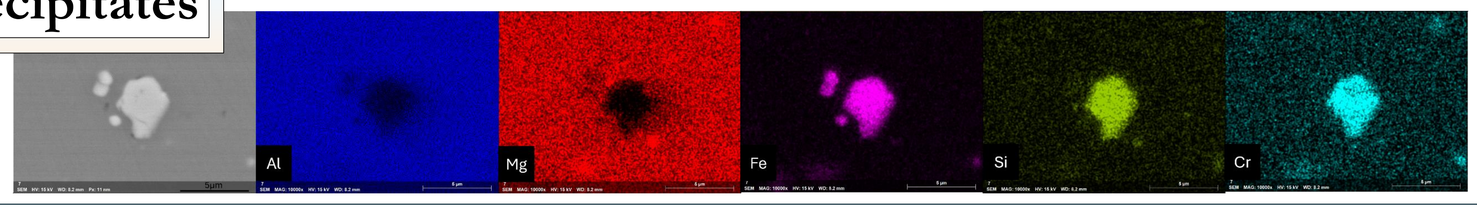
Grains



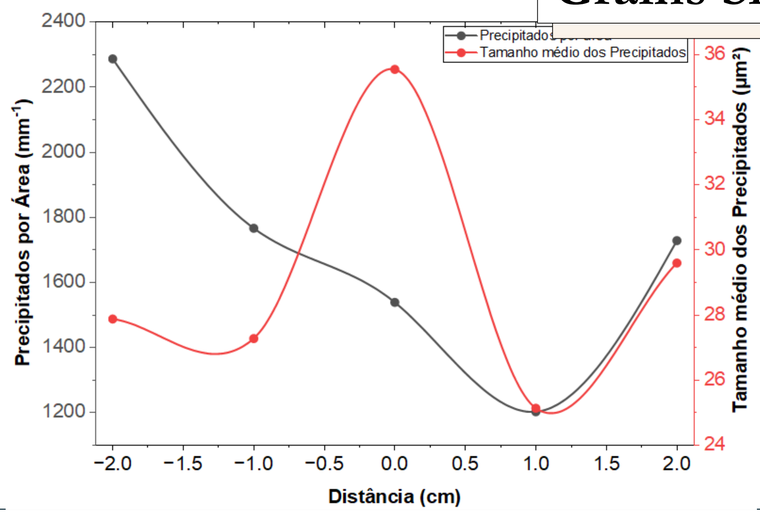
Hardness



Precipitates



Grains Size



Conclusions

- The FSW process modified the microstructure of the materials, inducing grain refinement in the TMAZ, grain growth in the HAZ, and mixing of the metals in the NZ.
- Regarding the hardness of AA5052-H32, precipitate dissolution occurred in the weld-affected zones. However, at the 0 cm region, the precipitates coalesced due to the slower cooling rate in this region.

References

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[3] Mishra RS, Ma ZY. Friction stir welding and processing. Materials Science and Engineering: R: Reports 2005;50:1–78. https://doi.org/10.1016/j.mser.2005.07.001.

Acknowledgments

FAPESP 24/00191-5

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