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Material Circularity Through Reusing AlSi10Mg Waste in 3DPMD

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This study investigates the sustainable reuse of printed AlSi10Mg parts in metal Additive Manufacturing (AM) for Plasma Directed Energy Deposition (DED) processes, aiming to advance material circularity in the automotive industry. We focused on evaluating porosity on recycled AlSi10Mg specimens.

The research involved processing AlSi10Mg from used parts into powder for plasma DED, fabricating test specimens, and assessing their mechanical integrity. Preliminary findings suggest that recycled AlSi10Mg powder can achieve mechanical properties comparable to virgin material with optimal parameter adjustments and heat treatment.

These results support a circular economy in metal AM, promoting the reuse of printed AlSi10Mg materials in manufacturing. This approach not only contributes to sustainability but also meets critical performance standards in the automotive sector, demonstrating a viable method for waste reduction and resource optimization in industrial manufacturing.

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