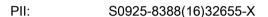
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Microstructures and properties evolution of spray-deposited Al-Zn-Mg-Cu-Zr alloys with scandium addition

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ACCEPTED MANUSCRIPT

1	Microstructures and properties evolution of spray-deposited
2	Al-Zn-Mg-Cu-Zr alloys with scandium addition
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9	
10	Abstract
11	In this work, the effect of Sc content on the microstructures and mechanical properties
12	of Al-Zn-Mg-Cu-Zr alloys prepared using spray deposition was studied.
13	Microstructure observations reveal that not only the grain size, but also the coarse
14	secondary phase can be refined by Sc addition through the formation of a hybrid
15	structure coupled by $\eta\text{-Mg}Zn_2$ and $Al_3(Sc,Zr)$ phases near and at the grain boundaries
16	It is inferred that the primary Al ₃ (Sc, Zr) particles can act as nucleation sites for the
17	η-MgZn ₂ phase during the deposition process. With the increase of Sc content, the
18	continuous secondary phase at the grain boundaries converts gradually into small
19	discontinuous particles, which contributes to the considerable improvement in tensile
20	strength and elongation. The alloy with 0.2 wt.% Sc exhibits excellent combinations

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