

## **The use of recycled material in the production of powders of a Al-based quasicrystalline phase former alloy**

L. Michelotti<sup>1,\*,#</sup>, C.S. Kiminami<sup>1,2</sup> e P. Gargarella<sup>1</sup>

<sup>1</sup>Departamento de Engenharia de Materiais, Universidade Federal de São Carlos, Rod. Washington Luis Km 235, 13565-905, São Carlos, Brasil

<sup>2</sup>Programa de Pós-Graduação em Ciência e Engenharia de Materiais, Universidade Federal de São Carlos, Rod. Washington Luis Km 235, 13565-905, São Carlos, Brasil

#Corresponding author: leandro\_michelotti@hotmail.com

Aluminum-based quasicrystalline phase former alloys are light alloys with high mechanical strength and wear resistance, which are promising to be used in high temperature applications. These alloys are usually made from high purity elements. No study was carried out in order to verify the possibility to use low-cost recycled raw materials. This study investigated the use of aluminum cans for production of a  $\text{Al}_{91}\text{Fe}_4\text{Cr}_3\text{Ti}_2$  quasicrystalline phase former alloy. The powders were produced by gas atomization and characterized by X-ray diffraction, differential scanning calorimetry, microscopy and energy-dispersive X-ray spectroscopy. The results showed that quasicrystalline phase was formed only in powders with size smaller than  $75\mu\text{m}$ . As smaller is the powder, a higher amount of quasicrystalline phase is formed as a result of the higher cooling rate applied during solidification. Nevertheless, the fraction of powders with size smaller than  $75\mu\text{m}$  was too small, which makes necessary to use another equipment with larger atomization gas pressure.