

## Welding Of CuZr-Based Metallic Glasses On Air

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The exceptional mechanical properties of metallic glasses make them promising for several structural applications. Nevertheless, the processing of these materials requires high cooling rates, which limits the sample's size. A good alternative to have large parts is welding different small pieces of material while keeping their amorphous structure. The research group of DEMA/UFSCar has developed a technique based on Joule effect heating. By applying pressure and electric current and reaching temperatures in the supercooled liquid region (between the crystallization and glass transition temperatures), the viscosity of metallic glasses decreases, which allows the welding. The aim of this work was to weld samples of 2 and 3 mm in diameter and 4 mm in length of  $\text{Cu}_{46}\text{Zr}_{42}\text{Al}_7\text{Y}_5$  and  $(\text{Cu}_{47}\text{Zr}_{45}\text{Al}_8)_{98}\text{Y}_2$  metallic glasses using the method developed in DEMA/UFSCar. The as-cast and welded samples were analyzed by optical and scanning electron microscopy, differential scanning calorimetry and X-ray diffraction. The results showed that this welding process is feasible to be used since no crystals were formed during the welding process and there were no defects formed in the welding region. This work showed that an appropriate choice of parameters is very important to have a satisfactory welding.

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