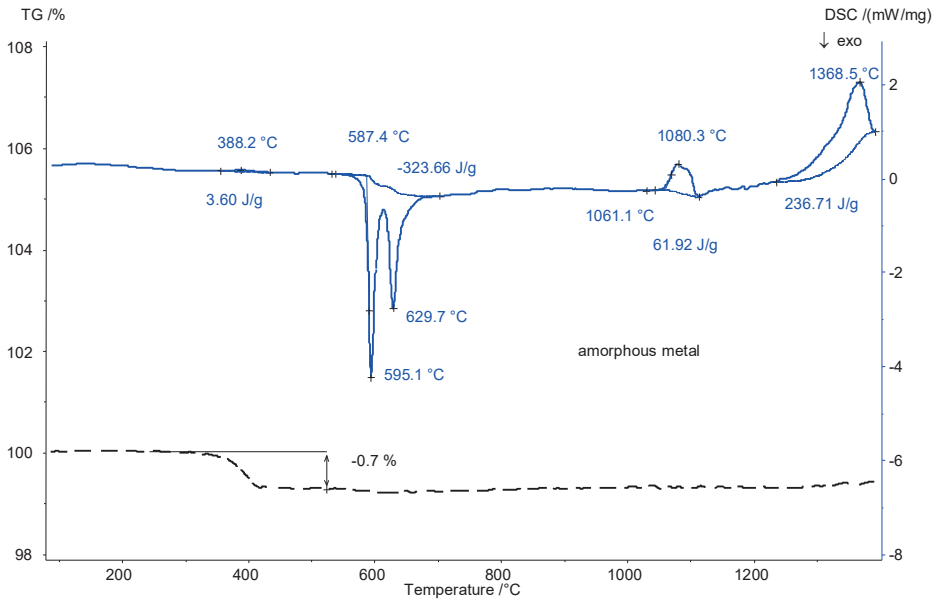
APPLICATION**SHEET**

Amorphous Metals · Metals
STA 449 ***F1*** *Jupiter®*

Amorphous Fe Alloy

Introduction

An amorphous metal is a metallic material with a disordered atomic-scale structure and, in contrast to "normal" crystalline metals or alloys, in a glassy, non-crystalline state. Amorphous metals are usually alloys which were cooled very rapidly (vapor deposition, spinning, etc.). They can be based on gold-silicon, zirconium, palladium, iron, titanium, copper or magnesium. Iron-based amorphous alloys (Fe-Ni-Co-Si-B) show a higher strength than steel but are not ductile and can show a sudden failure.Applications could, e.g., be in military use, but these materials find, of course, also employment in civil applications, for xample, as sensors in safety systems because of their magnetic properties.



Test Conditions

Temperature range:	RT ... 1400°C
Heating/cooling rates:	10 K/min
Atmosphere:	Argon at 60 ml/min
Sample mass:	23 mg
Crucible:	Pt with alumina liner
Sensor:	TGA-DSC type S

Test Results

This iron-based amorphous alloy showed a small mass-loss step of 0.7% between 300°C and 400°C (probably evaporation of organic contamination). At 587°C (extrapolated onset), the alloy crystallized in two steps. The exothermal enthalpy was relatively high with 323 J/g. At 1061°C (extrapolated onset), an endothermic DSC peak was detected which could be due to a phase transition. Melting of the substance started around 1250°C with a peak temperature at 1368°C. The melting enthalpy was determined to 236 J/g. The melting peak, however, was not finished at 1400°C.

NGB · Application Sheet 062 · E · 0621 · Technical specifications are subject to change.

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