

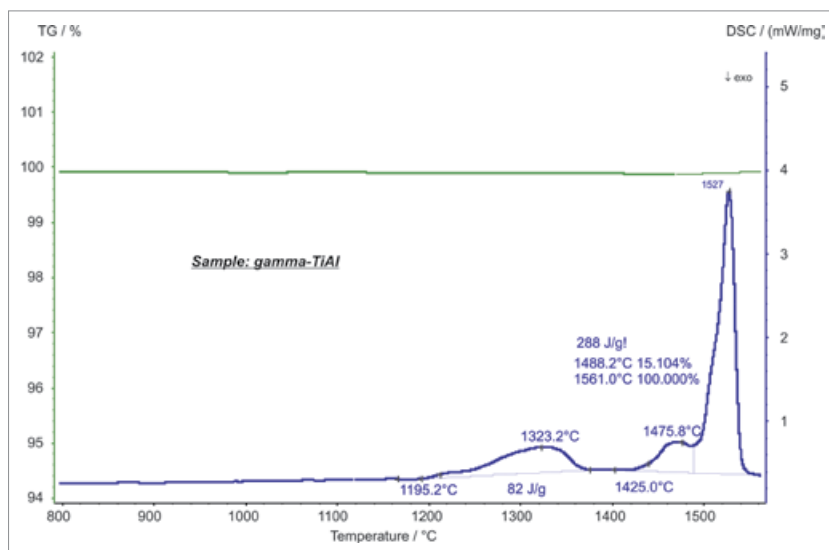
APPLICATION SHEET

METALS/ALLOYS – METAL INDUSTRY/RESEARCH

GAMMA-TiAl

The high-performance metal γ -TiAl distinguishes itself through high temperature and corrosion resistance with a low specific weight. It is used, for instance, in turbochargers, turbines, and motors as well as in aircraft and space

applications. This material can be considered as an exemplary alloy investigated by STA (=TG+DSC). Typically, phase transformations like melting but also mass changes due to oxidation or reduction can be observed.



Instrument

STA 449 **F3** Jupiter®

Test Conditions

Temperature range	RT ... 1600°C
Heating/cooling rates	20 K/min
Atmosphere	argon (70 ml/min)
Sample mass	30.08 mg
Crucible	Pt+Al ₂ O ₃ liners
Sensor	TG-DSC type S

Results

The DSC signal shows an endothermic effect (1322°C peak temperature) beginning at an extrapolated onset temperature of 1195°C; this is due to the structural $\alpha \rightarrow \alpha$ transformation. At 1476°C (DSC peak temperature), the $\alpha \rightarrow \beta$ transformation occurred. The endothermic DSC peak at 1528°C is due to melting of the sample (onset at approx. 1490°C, liquidus temperature at about 1560°C). No significant mass changes were detected during the experiment indicating that the sample did not oxidize during the experiment.