SI.1 Preparation strategy of sub-mAl@GAP

For the coating preparation, the ethyl acetate was used to dissolve the GAP at 70 °C under ultrasonic agitation. To ensure the stability of the GAP solution during the coating process, the Al blend was also kept at 70 °C. The GAP solution was dropwise added into the Al blend under vigorous agitation. The resulted mixture was naturally cooled down to 40 °C and kept that way until the solvent was fully evaporated. Following that, the product was vacuum dried in the furnace at 70 °C for 24 h. The product was identified as sub-mAl@GAP.

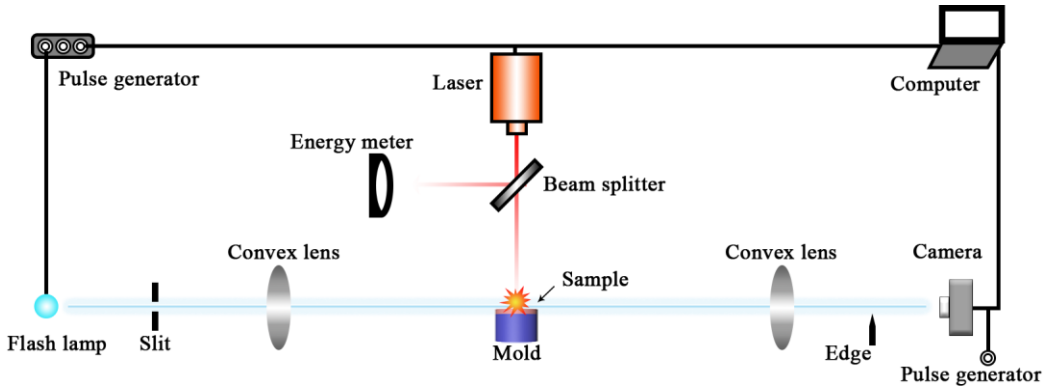

Figure S1. Diagram for the laser-Schlieren system.

Table S1 Physical and chemical properties of the materials.

Materials	Melting point/°C	Boiling point/°C	Decomposition temperature/°C	Energy content*/(kJ/g)
Al	660	2327		23.65
Al_2O_3	2050	2980		
GAP	—	—	165	20.16

*Energy contents here were measured values.