Claims

1. A method for additively manufacturing a part using a directed energy deposition apparatus, the method comprising steps:

(a) depositing a material onto a build platform of the directed energy deposition apparatus to form a current layer of the part;

(b) melting the material in the current layer;

(c) cooling the part comprising the current layer to thereby cure the melted material;

(d) measuring a temperature of the part during said cooling;

(e) after the part has cooled to a predefined temperature, depositing the material onto the current layer to form a next layer of the part; and

(f) repeating steps (a) to (e) to thereby fabricate on the build platform the part comprising a plurality of successive layers,

wherein the predefined temperature is dependent on an ordinal number of the respective layer being formed, such that each successive layer has a respective predefined temperature; and

wherein the predefined temperatures of the successive layers gradually decrease across the successive layers according to their ordinal numbers.

2. The method according to claim 1, wherein the temperature of the part is measured using a thermal camera.

3. The method according to claim 1 or 2, wherein the predefined temperature is further dependent on the material.

4. A product comprising the part fabricated by the method according to any one of claims 1 to 3.

5. A directed energy deposition apparatus for additively manufacturing a part, the apparatus comprising:

a build platform for fabricating the part thereon;

a supply chamber comprising a nozzle for depositing a material onto the build platform;

a heat source for melting the material;

a thermal device for measuring temperature of the part;

a controller configured for:

(a) depositing the material from the supply chamber onto the build platform to form a current layer of the part;

(b) activating the energy source to melt the material in the current layer;

(c) deactivating the energy source to cool the part comprising the current layer to thereby cure the melted material;

(d) measuring, using the thermal device, a temperature of the part during said cooling;

(e) after the part has cooled to a predefined temperature, depositing the material from the supply chamber onto the current layer to form a next layer of the part; and

(f) repeating steps (a) to (e) to thereby fabricate on the build platform the part comprising a plurality of successive layers,

wherein the predefined temperature is dependent on an ordinal number of the respective layer being formed, such that each successive layer has a respective predefined temperature; and

wherein the predefined temperatures of the successive layers gradually decrease across the successive layers according to their ordinal numbers.

6. The apparatus according to claim 5, wherein the thermal device comprises a thermal camera.

7. The apparatus according to claim 5 or 6, wherein the predefined temperature is further dependent on the material.