

# Recommended 3D printing process parameters for AMDAP™ HTC45 and AMDAP™ HTC40

The process parameters shown in Table 1 are for GE Additive’s Concept Laser M2 machine .  
When using other 3D printers, please refer to the table for optimizing conditions.  
Please feel free to ask our Metal Powder Department about the process parameters.

Table 1 Recommended process parameters

Part		Laser power (W)	Laser spot diameter (μm)	Scanning speed (mm/s)	Hatching distance (mm)	Layer thickness (μm)
Product	Inside	300	180	600	0.13	50
	Contour	150	100	300	—	50
Downskin		380	180	950	0.13	50
Supporting part		150	100	700	—	50

The recommended laser scanning pattern is a checker-board type and the recommended base plate temperature is 200°C.

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# 3D printing process at contour part

Two-time irradiating laser on the contour part can reduce defects in the border between contour part and inside part. (The second time is shifted 70  $\mu\text{m}$  inward from the first time.)

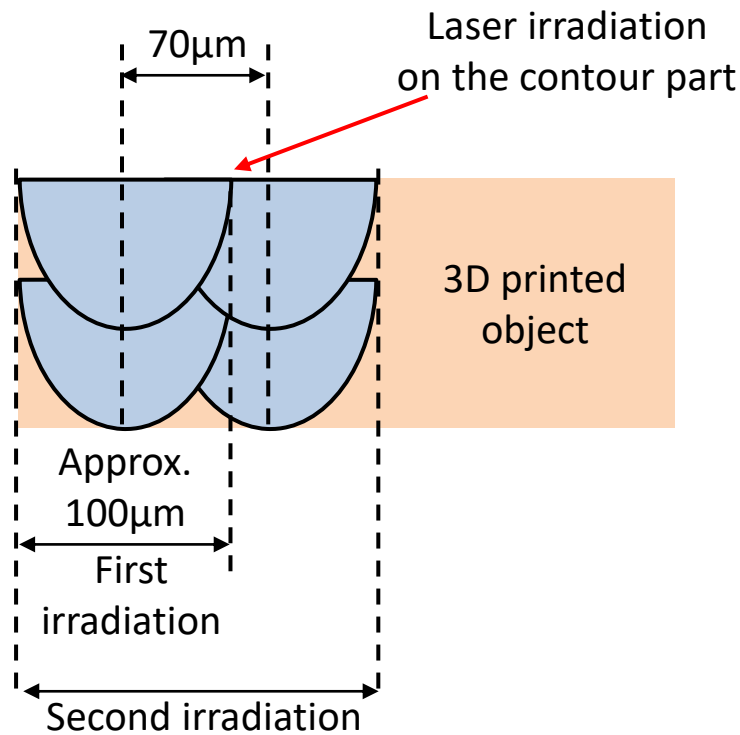


Fig.1 The Schematic of the two-time laser irradiation to form the outline part.

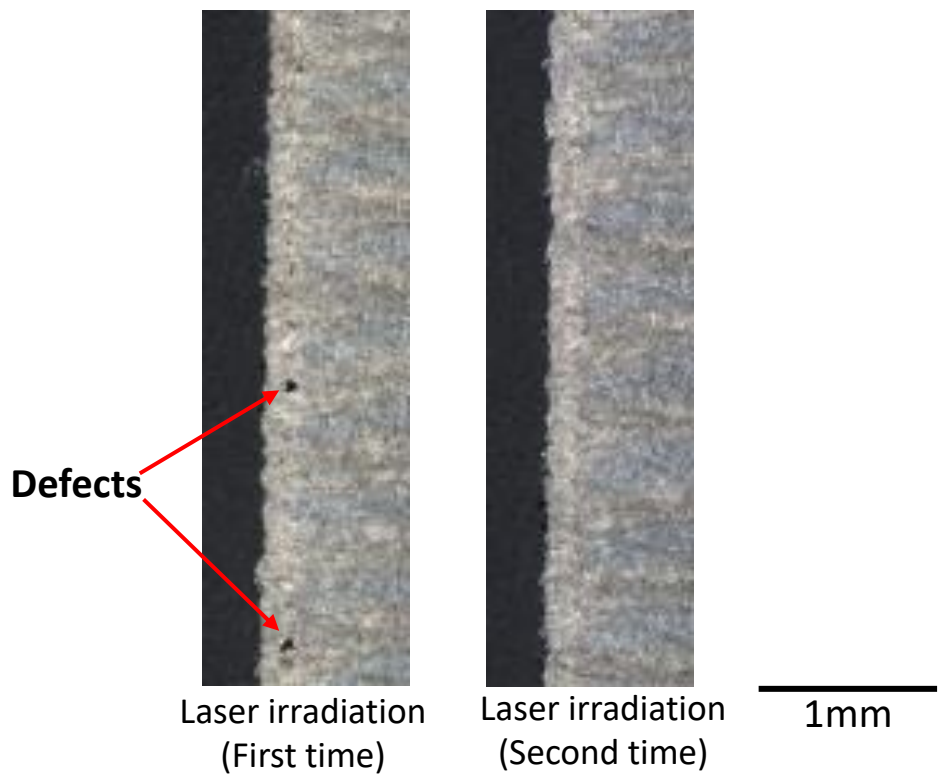


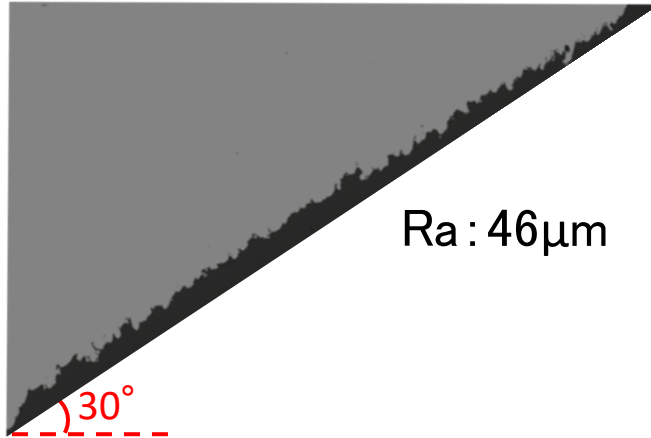
Fig.2 Effects of two-time laser irradiation at the surface.

## 3D printing process at downskin part

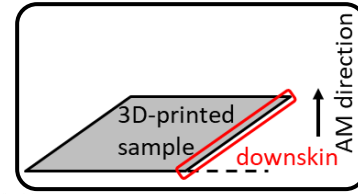
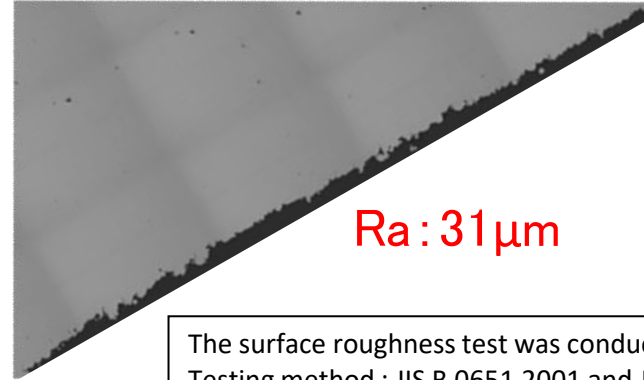
Since the surface of the downskin part tends to be rough, the surface roughness can be reduced by applying the specific molding parameters shown in Table 1.

**(Note : Downskin contour area should be irradiated by a single laser.)**

The same 3D printing conditions as product inside



Recommended conditions

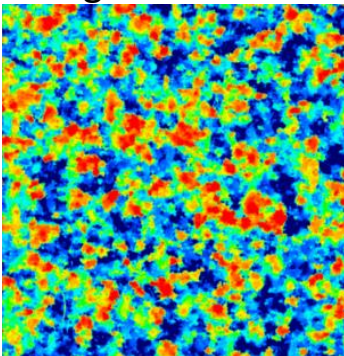


AM direction

The surface roughness test was conducted by stylus method.  
Testing method : JIS B 0651 2001 and JIS B 0601 2001 Standard  
Touch needle : DM47501(conical shaped diamond, 2μmR, 60° )

Fig. 3 The comparison of cross-sectional roughness of the downskin part.(the angle of the downskin: 30° )

The same 3D printing conditions as product inside



Recommended conditions

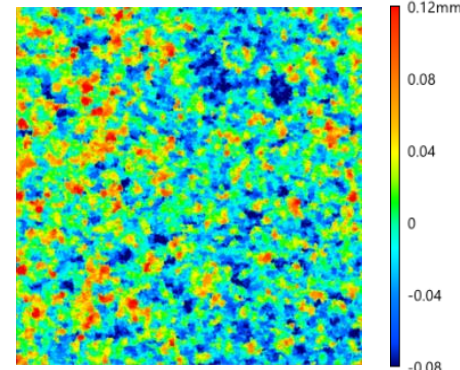


Fig. 4 The comparison of the surface roughness of the downskin area by 3D measurement.