

## Residual stress characterization of Ti-6Al-4V specimens using selective laser melting

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One of the advanced manufacturing processes with innovative technology used for the manufacture of dense components with intricate geometry is the Selective Laser Melting (SLM). Material properties and the strength of the linkages of material layers

determines the mechanical properties of SLM manufactured parts. Deformation of parts, residual stresses and crack formation, however, result due to locally concentrated energy input because of the high-temperature gradient. The technique used for strain relaxation was incremental hole drilling. It was used to characterize residual stress in a rectangular shape of Ti-6Al-4V specimens measuring 50x10x50 in the XY and X directions respectively. Measurements were taken with the sample attached to wrought titanium

base plate and with sample detached from wrought titanium base plate. The technique used to remove the base plate of wrought titanium from Ti-6Al-4V specimens was EDM. This technique was chosen due to its ability to reduce the risk of inducing more stresses in the sample. The height of the sample did not show a significant influence on residual stress. However, the stress component  $\sigma_z$  showed higher stress compared with stress component  $\sigma_x$ .

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