

Engraving

TBC Removal for Super Alloys

Thermal Barrier Coats (TBC's) are used in aero engineering and gas turbine manufacturing to extend the lifetime of components. TBC is also becoming more commonly used in the automotive industry to reduce heat loss from engine exhaust systems. TBC's insulate materials from prolonged and high intensity thermal exposure, which reduces oxidation of the component. Thermal barrier coatings consist of multiple layers of the metal substrate, bond, coat, thermally grown oxide and a ceramic topcoat.

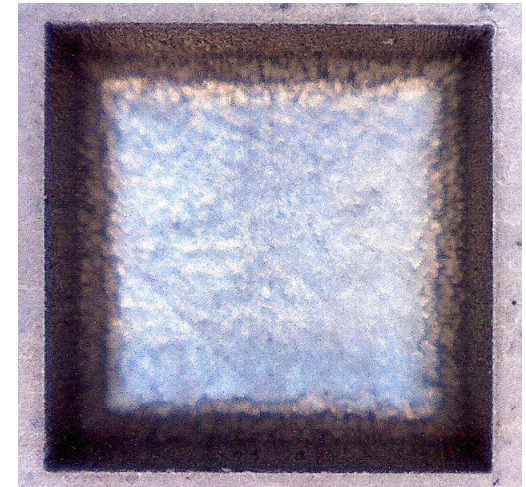
The challenge with TBC removal is to remove the very thick layers while maintaining the quality of the surface by avoiding burning and caused surface roughness. SPI's G4 70W EP-Z offers the optimal combination of short process time, high quality metal surface texture once TBC was removed and a very small heat affected zone. An additional benefit to this application process is that it does not require any gas assistance, meaning a substantial cost saving.

Process time for removing very thick (8mm) layers of TBC with a high quality surface texture in a 2x2mm square is 63 seconds and a 10x10mm square takes up to 19 minutes. Process times can be reduced by around 10% but the quality of the resulting surface finish will be impacted. SPI's 100W EP-Z can also be used at Waveform 30 to achieve a faster process time, however results have a larger heat affected zone.

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Application Parameters

Type	G4 70W EP-Z
Power	70W
M ²	<1.6
Beam Ø	8mm
Scanner/Lens	>8mm/163mm FL-theta
Energy	WF35 100kHz @ 2000mm/s

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