Cutting

Cutting Aluminium Foil

This is an example of thin 0.015mm metal foil slitting. Trials showed that WF0 produced clean, fast cuts, however the fastest speed was not obtained at PRF0 but at 100kHz.

This cutting process uses single pulse processing and the maximum cutting speed at any given frequency is determined by the combination of spot diameter and pulse repetition frequency in order to avoid pulse to pulse spot separation.

In addition, the pulse energy must be sufficient to cut through the full sheet thickness using only a single pulse. The best combination of these parameters was found to be 100kHz, which enabled a maximum cutting speed of 2.5m/s. If the pulse repetition frequency was increased the cut quality became intermittent due to the reduced pulse energy.

The workstation used a 75mm BEC which produced an 8.1mm (1/e2) diameter beam at the scanner entrance, which allows a 10mm aperture scanner to be used. A 163mm focal length scanner objective lens was used, giving a field size of 100 x 100mm which is sufficient for many applications, particularly in the packaging industry.

Application Parameters

Type	G4 50W HS-h
Power	50W
M^2	<1.3
Beam Ø	8mm
Scanner/Lens	10mm aperture / 163mm F-theta
Energy	WF0 0.5mJ @ 100kHz