

'Choosing the right resonator'

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The market for sheet metal laser cutting machines has developed rapidly in recent years, with the introduction of new types of machines that are revolutionising the laser cutting process.

When specifying machines, users have three main choices, dependent upon their own specific requirements, namely the traditional CO₂ sheet metal laser cutting machines, fibre laser cutters and the revolutionary direct diode laser or DDL.

The traditional CO₂ laser has long been the preferred method. This type of machine uses CO₂ laser gas and electricity to create a laser beam, which is then applied to sheet metal.

However, in recent years the market has begun to move towards new technologies, specifically fibre. Fiber lasers use optical fibers, 'pumped' with diodes to create solid-state laser machines with far fewer components.

The reason behind the rapid uptake in fibre is the superior cutting speeds and cost-saving benefits. Fibre lasers use a shorter beam wavelength - approximately 90% shorter than a CO₂ laser beam and a smaller spot diameter. This provides faster penetration of the material, a 30% plus increase in productivity and the ability to cut reflective materials. Fibre also benefits from an 80% reduction in oscillator power consumption, no laser gas and significantly reduced maintenance.

The final option is Direct Diode Laser technology, or DDL. This technology uses diodes directly, thereby eliminating the 'pumped' fibre system used in fibre laser technology. This makes the DDL more efficient due to the elimination of the middle process. DDL is also the smallest and most reliable laser source, with no compromise on beam quality.

In terms of productivity, a DDL laser can cut thin material 20% faster than fibre lasers and thick materials with unsurpassed surface quality. Also capable of a wall plug efficiency of 40-50% compared to 10% for a CO₂ resonator, 15-20% for a disc resonator and 30-40% with a fibre resonator.