

Pulsed laser machining method and pulsed laser machining
equipment, in particular for welding, with variation of the power
of each laser pulse

ABSTRACT

5 The laser machining method includes the following steps:

 A) Generating, by means of a laser source, a laser beam having
an initial wavelength of between 700 and 1200 nanometres formed of a
series of laser pulses (10).

 B) Doubling the frequency of one part (12) of the laser beam by
10 means of a non-linear crystal;

 C) Varying the power during each emitted laser pulse (10) so that,
throughout the period of said laser pulse, the power profile has a maximum
peak power or part of the pulse with a maximum power in an initial sub-
period (T1), and in an intermediate sub-period (T2) of longer duration than
15 the initial sub-period, a lower power than said maximum power throughout
the entire intermediate sub-period.

 The variation in laser power is achieved so that the maximum power
value is at least two times higher than the mean power throughout the
period of the laser pulse and the increase time to maximum power from the
20 start of each laser pulse is less than 0.3 milliseconds. The machining
method concerns in particular the welding of highly reflective metals,
particularly copper, gold, silver or an alloy including one of these metals.

 The invention also concerns a laser machining equipment for
implementing the method described above.

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Figure 3