[CLAIMS]

[Claim 1]

Ceramic cutting equipment comprising:

a beam irradiation unit for irradiating a beam of a wavelength absorbed by the pattern formed on an upper surface of a ceramic and partially absorbed by the ceramic;

a coolant spraying unit for spraying a coolant to the ceramic irradiated with the beam to cool the ceramic; and

a separation unit for separating the ceramic by providing force or shock to a stress line formed in the ceramic due to heating and cooling by the beam and the coolant; and

a control unit controls the beam irradiation unit, the spraying unit and the separateion unit;

wherein the coolant spraying unit includes a spray nozzle for spraying a coolant to the ceramic irradiated with the beam, and a flow regulator for adjusting an amount of the coolant sprayed in proportion to an output of the beam irradiated from the beam irradiation unit,

a cooling area to which the coolant is sprayed is formed to transmit the beam therethrough and entirely or partially cool an irradiation area to which the beam is irradiated,

the beam irradiation unit and the coolant spraying unit simultaneously heat and cool the ceramic formed thereon with a pattern to recrystallize the ceramic, or heat and cool the ceramic right before the ceramic is melted to remove part or all of the pattern, and generate

a stress by recrystallization or thermal expansion and contraction of an upper surface or all of the ceramic,

the coolant spraying unit adjusts, by the flow regulator, the amount of the coolant sprayed in proportion to the output of the beam irradiated from the beam irradiation unit, and

the separation unit separates the ceramic by providing additional force or shock to the stress line to cut the ceramic while reducing thermal damage,

the control unit is configured to generate a control signal to adjust the amount of the coolant sprayed from the cooland spraying unit in proportion to intensity of the beam irradiated from the beam irradiation unit, and

the flow regulator adjusts a flow rate of the coolant injected through the injection nozzle according to the control signal of the control unit.

[Claim 2]

The equipment of claim 1, wherein the beam is set to have a wavelength of 100 nm to 11 μm, and the beam is set to have energy density of $1X10^{1}$ mW/mm^{2} or more.

[Claim 3]

A method for cutting a ceramic formed thereon with a pattern, the method comprising:

(a) irradiating, by a beam irradiation unit, a beam of a wavelength absorbed by the pattern and partially absorbed by the ceramic;

(b) spraying, by a coolant spraying unit, a coolant

onto the ceramic irradiated with the beam;

(c) cutting, by a separation unit, the ceramic by providing force or shock to a stress line formed in the ceramic due to heating and cooling by the beam and the coolant; and

(d) adjusting, by a flow regulator, an amount of the coolant sprayed in proportion to an output of the beam irradiated from the beam irradiation unit, wherein

a cooling area to which the coolant is sprayed is formed to transmit the beam therethrough and entirely or partially cool an irradiation area to which the beam is irradiated,

part or all of the pattern is removed by simultaneously heating and cooling the ceramic,

a stress is caused by recrystallization or thermal expansion and contraction of an upper layer or all of the ceramic, and

additional force or shock is provided onto the stress line, thereby cutting the ceramic while reducing thermal damage.

[Claim 4]

The method of claim 3, wherein the beam is set to have a wavelength of 100 nm to 11 μm, and the beam is set to have energy density of $1X10^{1}$ mW/mm^{2} or more.