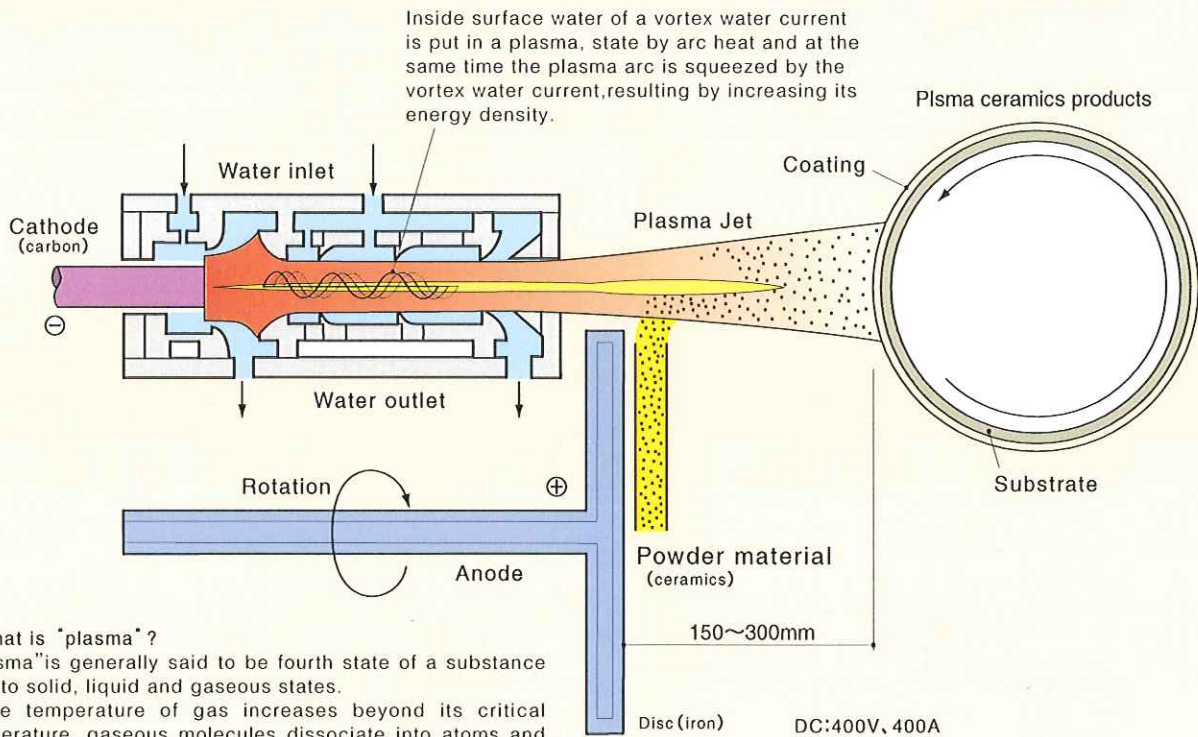
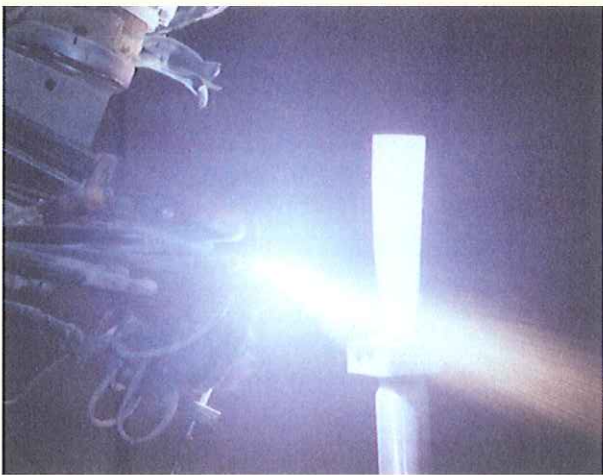


Water plasma spraying



■What is "plasma" ?

"plasma" is generally said to be fourth state of a substance next to solid, liquid and gaseous states. If the temperature of gas increases beyond its critical temperature, gaseous molecules dissociate into atoms and further electrons are repelled out of atoms to ionize, resultingly producing a state in which molecules, atoms, (+)ions and (-)electrons exist together. Such a mass of ionized high temperature gases is called "plasma".



The mechanism of this apparatus is devised for a high pressure water current fed into a torch to produce a cylindrical vortex water current.

Voltage applied across the carbon cathode and the iron-made rotating anode to forcibly generate a D.C. arc causes the inside surface water of the vortex water current to vaporize and be put in a plasma state after decomposition, continuously generating a plasma arc. Being squeezed by the turning cylindrical water current and increasing its energy density, the plasma arc blows out as a high temperature and high speed stable plasma jet flare affected by the rapid thermal expansion of the plasma.

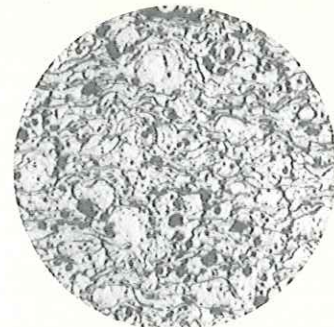
The plasma jet flare, the highest temperature of which reaches as high as about 30,000°C, enables to easily spray even ceramics with a high melting point.

■General characteristics

- A very high spraying capacity per unit time as high as 50kg at its maximum.
- Thick overlay of a sprayed film about 20mm possible. Control of a raw material temperature at 200°C or below during the prosecution of work possible.
- Most suitable for a mass and thick overlay spraying of a large member.
- A cheap spraying cost.

■Characteristics of ofic

- OFIC enables to increase a film thickness limit to 20-50mm from 20mm which has so far been its limit.
- OFIC enables to spray even a metal type compound as a material which has so far been limited to oxide type ceramics.



Spraying material : alumina-zirconia
(50 magnifications)