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**Heat Transfer to Anode of Arc as Function of Transverse Magnetic Field and Lateral Gas Flow Velocity** YOSHIYUKI ZAMA, TORU SHIINO, YOKO ISHII, YOSHIFUMI MAEDA, SHINJI YAMAMOTO, TORU IWAO, Tokyo City University — Gas tungsten arc welding has useful joining technology because of high-energy and high-current characteristics. It can be flexible from the transverse magnetic field and lateral gas flow velocity. In this case, the weld defect occurs. In this research, the heat transfer to the anode of the arc as a function of the transverse magnetic field and lateral gas flow velocity is elucidated. That magnetic flux density and lateral gas velocity were varied from 0 to 3 mT and 0 to 50?m?s−1, respectively. The axial plasma gas argon flow rates were 3?slm. A transverse magnetic field is applied to the arc using Helmholtz coil. The anode is used by a water-cooled copper plate, and the heat transfer is measured by temperature of cooled water. As a result, the arc is deflected by the Lorentz force and lateral gas convection. Thus, the heat transfer to the anode of the arc decreases with increasing the transverse magnetic field and lateral gas flow velocity. In addition, the heat transfer to the anode changes with different attachments modes. The lateral gas flow causes a convective heat loss from the arc to the chamber walls.

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