

Development of Braking System to Cope with Increased Speed of Shinkansen

Shinichi SAGA Hajime TAKAMI Yasuaki SAKAMOTO

Considering the increase in heat load on the brake disks as the speed of Shinkansen increases, the heat capacity of the current steel brake disks is approaching its limit. Therefore, from the viewpoint of reducing the heat load on the brake disk, one of the methods to be considered is to form heat-resistant layers on the friction surface of the brake disk. As a result, we apply laser metal deposition welding, which is the latest technology. As a result of a bench test of a brake disk to which this method is applied, we find that the basic performance is satisfied, the wear resistance is improved by about three times compared to the current disk, and no cracks occurs. In addition, as a countermeasure against the sliding, which is a concern due to the increase in braking force, non-adhesion brake system that combines a disk brake with an aerodynamic drag brake and a rail brake is investigated, and its stopping distance is evaluated. This paper reports the test results of the laser metal deposition welding applied to the friction surface of a brake disk as a heat load reduction method. In addition to that, the effect of shortening the stopping distance by the system combined with the non-adhesive brake is also introduced.