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## Tests begin on a new nickel-based single crystal superalloy bucket which improves the thermal efficiency of medium capacity gas turbines and reduce carbon emission



Exterior of the single crystal bucket



Bucket fitted on a H25 gas turbine

Hitachi, Ltd. announced today that they have introduced a low cost, high temperature and oxidation resistant nickel-based single crystal superalloy to the H25 gas turbines at the Goi Power Station of Goi Coast Energy, Ltd., and will begin testing in what will be the first domestic tests on a several million watt-class medium capacity gas turbines. The nickel-based single crystal superalloy developed combines alloys of carbon, boron, tungsten and tantalum, etc. to optimize for strength at high temperatures and resistance to oxidation. Further, the superalloy cast from this alloy was coated with an heat insulating ceramic to reduce the heat of the components, and improve durability and reliability. By employing this single-crystal superalloy in a several million watt-class medium capacity gas turbine, a significant improvement in thermal efficiency can be achieved, and a significant reduction in CO<sub>2</sub> emission is expected.