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HIP process of a valve body to Near-Net-Shape using Grade 91 powder

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Material used for steam piping of power plants is exposed to high temperatures and high pressures over long periods. As a consequence, forged Grade 91 alloy steel is commonly chosen to meet these demands. However, complicated structures such as a valve body need to be machined from large forged blocks. As a result, the machining time is long and the material weight is heavy. Therefore, by manufacturing a valve body with near net technology, both time and material weight can be reduced.
This paper will present 1) A survey of the dimensions of a near net shape valve body by HIP, 2) An investigation of the mechanical properties of NNS Grade 91, 3) A comparison of the structure of a HIP sintered product and a forged product, 4) The machining time and material weight of a near net molded product by HIP compared to a product forged from blocks. This paper will illustrate that the near net shaped product was able to reduce the machining time by 30% and the material weight by 40% than when machining from a forged product.

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Power Generation

Primary author(s) : Mr SHIOKAWA, Toyohito (Metal Technology Co. Ltd.)

Co-author(s) : Mr URAKAWA, Hiroshi (SHIMODA IRON WORKS CO., LTD.); Mr OKUWAKI, Mitsuo (Metal Technology Co. Ltd,); Mr NAGAMACHI, Yuto (Metal Technology Co. Ltd,)

Presenter(s) : Mr SHIOKAWA, Toyohito (Metal Technology Co. Ltd.)

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