

Net Shape HIP Process for the Parts of Rocket Engine Turbopump

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Net Shape HIP (NSHIP) process is a suitable approach for both high performance and cost reduction compared to the castings and the machining of forged materials. We have developed the NSHIP technology in order to utilize for the LE-9 engine turbopump of H3 rocket which is under development by JAXA.

In this paper, we show the verification result of our modified FEM analysis model which predicts a dimensional change under the HIP sintering process. With this FEM analysis tool, we have established the high quality and stable process of manufacturing the LE-9 fuel turbopump turbine nozzle. We also confirmed that the NSHIP turbine nozzle have excellent material properties to meet requirements for the turbopump.

From these results, we determined to proceed to the next phase of the NSHIP part development, the engine testing which is currently performed.

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