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HIP Activities for Turbopump Components of Korea Space Launch Vehicle

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In Korea, we are developing liquid rockets for commercial launch services, and the government agency, Korea Aerospace Research Institute (KARI), is responsible for main development. Turbopump, which is a key component of liquid rocket engine, is a rotating machine that pressurizes fuel and liquid oxygen in an extreme environment and supplies them to a combustion chamber. Design requirements are very severe because it must maintain lightweight feature while outputting very large power. The HIP (Hot Isostatic Press) method is a Near-Net Shape processing, which makes it easy to mold a material that is difficult to machine, while securing quality comparable to forged products. These advantages are particularly attractive for the aerospace sector. Recently, we tried manufacture of turbopump impellers and turbine discs using HIP technology, and some of the products have been assembled in a turbopump and ground-tested. This will be described in detail in this paper.

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