AM + HIP Post-Processing Guide

A practical route for connecting pore closure, heat treatment, inspection, and release evidence for metal additively manufactured parts.

1. When AM Components Benefit from HIP

Consider HIP when internal porosity, lack-of-fusion defects, fatigue sensitivity, or batch consistency limit release. HIP can close internal defects and improve density, but it does not replace support removal, machining, surface finishing, cleaning, or final inspection.

2. Define the Validation Route

Start with the alloy, printing process, powder batch, defect population, part envelope, and target properties. Define the HIP window together with any solution treatment, aging, URC or URQ cooling path, and the required CT, metallography, dimensional, and mechanical-property evidence.

3. Prepare the RFQ Package

Provide the material grade and build route, maximum dimensions and weight, annual throughput, baseline inspection data, target properties, applicable standards, facility constraints, and the desired acceptance package. This information allows a meaningful process-window and equipment assessment.

Stage	Engineering Objective	Recommended Evidence
As-built baseline	Characterize pores, lack of fusion, geometry, and surface condition.	CT or metallography; dimensional report; build and powder records.
HIP cycle	Close internal defects and establish repeatable density.	Pressure-temperature-time curve; load list; calibration and alarm records.
Post-HIP heat treatment	Set the required microstructure and mechanical properties.	Heat-treatment record; cooling curve; mechanical-test results.
Final release	Confirm part integrity, geometry, surface, and traceability.	Final CT or metallography; dimensional and surface reports; batch dossier.

Engineering note: the appropriate process window and inspection route depend on the alloy, manufacturing history, part geometry, and governing specification. Use this guide as an RFQ starting point, not as a qualified production recipe.