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Thermal Data-Readiness Gate

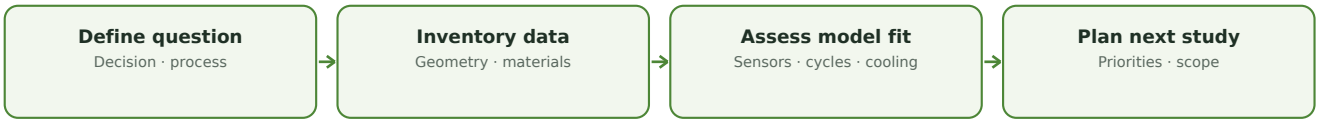
ENGINEERING SERVICE | BC-THERM-01 | S04-D | v1.1 | 12 November 2026

Document type: Service brief and scope outline.
Purpose: Organize process evidence and determine a useful scope for a customer-specific thermal study.
Typical engagement: 3–5 working days; fixed-scope paid engineering assessment.

1 Executive summary

BC-THERM-01 is a focused engineering assessment for manufacturers, die and insert specialists, equipment suppliers, and engineering firms that want to turn an HPDC thermal question into a structured and actionable study plan. Bamboos reviews the process question, geometry, materials, cycle records, temperature measurements, sensor metadata, and cooling information. The output is a prioritized data inventory, a model-fit assessment, and a practical plan for the next engineering step.

BC-THERM-01: a structured data-readiness engagement



2 Engineering decision and customer value

The assessment helps answer whether the available process information can support a useful thermal-analysis study, which inputs are already adequate, and which measurements or metadata would materially improve the next step. It can begin with partial information: the purpose is to establish what is known, what is missing, and how the engineering question should be bounded.

3 Work packages

Work package	Activities	Output
Question and process framing	Clarify the engineering decision, part/tool context, cycle stages, and intended use of the analysis.	Agreed question statement and process boundary.
Data and metadata inventory	Review geometry, material records, cycle timing, temperature histories, sensor positions, units, calibration, and cooling records.	Structured input inventory and traceability notes.
Model-fit assessment	Map the question to the current thermal/solidification formulation and identify assumptions that should be made explicit.	Model-applicability assessment and key assumptions.
Measurement and study plan	Prioritize missing data and define a bounded feasibility study or measurement task.	Prioritized data plan and next-stage scope.

4 Deliverables

- Engineering question and intended-use statement, with process boundary and principal assumptions.
- Data inventory covering geometry, materials, process timing, temperature measurements, sensor metadata, cooling information, and provenance.
- Data-quality review addressing units, timestamps, sensor coordinates, sampling interval, missingness, and traceability.
- Model-fit assessment identifying the variables and thermal mechanisms represented by the proposed study.
- Prioritized measurement or metadata plan, including the reason each additional input matters.
- Bounded proposal for BC-THERM-02 or an alternative measurement/design activity.

5 Information used in the engagement

The review can start with the information already available. The customer does not need to assemble a complete model-ready package before the first assessment; the engagement identifies the most useful next data to collect.

Information	Examples	Review focus
Engineering question	New die or insert; recurring thermal issue; cooling review; cycle-condition comparison.	Decision owner, intended use, and measurable question.
Geometry and materials	Die/cavity section, insert dimensions, casting thickness, alloy and tool grades.	Whether the geometry abstraction and material basis are appropriate.
Process records	Cycle timing, initial temperatures, operating sequence, machine settings where relevant.	Cycle phases and operating context.
Temperature records	Thermocouple histories, sensor type and position, calibration, sampling interval, uncertainty.	Traceability and ability to compare histories.
Cooling and provenance	Cooling-channel or insert description, flow/temperature records, file origin and cycle IDs.	Boundary-condition basis and data lineage.

6 Delivery approach and responsibilities

Bamboos Consulting	Customer	Optional specialist partner
Frames the engineering question; inventories and reviews available data; checks units, time bases, sensor positions, provenance, and missingness; maps the question to model scope; prepares the prioritized plan and bounded next-stage proposal.	Identifies the process owner and decision; provides authorized drawings or simplified geometry, material records, representative process files, and sensor context; explains operating phases and data-use permissions.	Where needed, supports sensor suitability review, additional measurement design, geometry preparation, or independent instrumentation under a separately agreed scope.

7 Engagement scope and commercial format

Planning element	Indicative definition
Service mapping	S04-D · Thermal Data-Readiness Gate
Indicative effort	3–5 working days (four-day planning baseline). Actual effort depends on the number of datasets, process variants, geometry records, and review meetings.
Commercial mechanism	Fixed-scope paid engineering assessment. The scope and fee are confirmed after the initial question and available information are reviewed.
Acceptance and review	Delivery of the agreed inventory, assessment, prioritized data plan, and next-stage recommendation. The assessment is complete when the agreed questions and evidence items have been reviewed and documented.

> Next step. Share a short description of the HPDC process question and the information already available. An initial discussion can establish whether a data-readiness assessment is the appropriate first engagement.

The final statement of work defines the specific engineering question, data package, model configuration, scenario count, review points, and deliverables. The engagement is tailored to the customer’s process and intended decision.