

Isometric Release Gate Checklist

Version 0.1 · Practitioner Review Draft

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DOCUMENT CONTROL

Drawing no.		Line no.	
Revision		Date	
Checker			
Release purpose	☐ Design review ☐ MTO / procurement ☐ Construction ☐ Fabrication ☐ As-built		

Purpose

This checklist provides a structured, repeatable check before a piping isometric is released for its intended purpose: design review, material take-off (MTO), procurement, construction or fabrication. Its aim is to reduce avoidable errors, omissions, inconsistencies and rework.

PRINCIPLE

An isometric should not be released simply because the drawing looks complete. It should be released only when the required checks have been completed, discrepancies have been resolved or formally dispositioned, and the release has been authorised.

This is a proposed framework for validation with practising designers, checkers and lead designers. It is not a substitute for project procedures, approved design documents, codes or engineering authority.

How to use

Apply the checklist at the appropriate release stage. Record one outcome for each applicable check:

PASS	Requirement satisfied and evidence available.
FAIL	Requirement not satisfied; correction required.
N/A	Not applicable; reason recorded.
HOLD	Unable to verify, awaiting information, or needs an authorised decision.

A critical failure or unresolved hold affecting the intended release prevents release until it is resolved or formally dispositioned. **A recorded exception is not automatically permission to release.**

Applies to columns (R = Design review, M = MTO / procurement, C = Construction, F = Fabrication) are left blank for the project to complete according to its own procedures.

Gate 0 Document and release identification

Applies to: R = Design review, M = MTO / procurement, C = Construction, F = Fabrication. **Result:** PASS / FAIL / N/A / HOLD.

ID	Check	Evidence / acceptance criterion	Applies to				Result				Comment
			R	M	C	F	PASS	FAIL	N/A	HOLD	
G0.01	Drawing number and title	Drawing number and title match the approved drawing register and line identification.	☐	☐	☐	☐	☐	☐	☐	☐	
G0.02	Revision and status	Revision and status match the authorised document control record.	☐	☐	☐	☐	☐	☐	☐	☐	
G0.03	Intended release purpose	The intended release purpose is identified.	☐	☐	☐	☐	☐	☐	☐	☐	
G0.04	Design inputs	P&ID, line list, piping specification, layout/model and other inputs are identified.	☐	☐	☐	☐	☐	☐	☐	☐	
G0.05	Input revisions	Inputs are at approved or current-for-purpose revisions.	☐	☐	☐	☐	☐	☐	☐	☐	
G0.06	Drawing completeness	Sheets, continuation references, notes and referenced details are present.	☐	☐	☐	☐	☐	☐	☐	☐	
G0.07	Previous comments	Previous review comments and outstanding actions have been checked.	☐	☐	☐	☐	☐	☐	☐	☐	
G0.08	Revision changes	Changes since the last revision are identified and incorporated or dispositioned.	☐	☐	☐	☐	☐	☐	☐	☐	
GATE 0 ACCEPTANCE Identity, revision, intended use and governing inputs are established. Stop if the revision or design basis cannot be confirmed.											

Gate 1 Design basis and line information

Applies to: R = Design review, M = MTO / procurement, C = Construction, F = Fabrication. **Result:** PASS / FAIL / N/A / HOLD.

ID	Check	Evidence / acceptance criterion	Applies to				Result				Comment
			R	M	C	F	PASS	FAIL	N/A	HOLD	
G1.01	Line number	Consistent with the line list and P&ID.	☐	☐	☐	☐	☐	☐	☐	☐	
G1.02	Line size	Agrees with approved design information, including legitimate size changes.	☐	☐	☐	☐	☐	☐	☐	☐	
G1.03	Piping class / specification	Correct class/specification identified and applied.	☐	☐	☐	☐	☐	☐	☐	☐	
G1.04	Fluid / service	Consistent with the design basis.	☐	☐	☐	☐	☐	☐	☐	☐	
G1.05	Design conditions	Pressure, temperature and other parameters are consistent.	☐	☐	☐	☐	☐	☐	☐	☐	
G1.06	Material requirements	Appropriate to the piping class and service.	☐	☐	☐	☐	☐	☐	☐	☐	
G1.07	Insulation and tracing	Insulation, heat tracing and jacketing are represented.	☐	☐	☐	☐	☐	☐	☐	☐	

ID	Check	Evidence / acceptance criterion	Applies to				Result				Comment
			R	M	C	F	PASS	FAIL	N/A	HOLD	
G1.08	Special requirements	Cleanliness, corrosion allowance, testing, examination and other project requirements are identified.	☐	☐	☐	☐	☐	☐	☐	☐	
G1.09	Design changes	Approved deviations and changes are reflected.	☐	☐	☐	☐	☐	☐	☐	☐	
GATE 1 ACCEPTANCE Line identity and requirements are consistent with approved information. Unresolved design-basis conflicts are escalated, not guessed at.											

Gate 2 Routing, geometry and interfaces

Applies to: R = Design review, M = MTO / procurement, C = Construction, F = Fabrication. Result: PASS / FAIL / N/A / HOLD.

ID	Check	Evidence / acceptance criterion	Applies to				Result				Comment
			R	M	C	F	PASS	FAIL	N/A	HOLD	
G2.01	Routing	Corresponds to the approved model or arrangement.	☐	☐	☐	☐	☐	☐	☐	☐	
G2.02	Dimensions	Dimensions, offsets, elevations, centre-to-centre and face-to-face dimensions are present and consistent.	☐	☐	☐	☐	☐	☐	☐	☐	
G2.03	Orientation	Flow direction, elevations and drawing conventions are clear.	☐	☐	☐	☐	☐	☐	☐	☐	
G2.04	North arrow	North arrow is present and correct: it points to project/plant north as used on the plot plan and model, and is consistent with the other isometrics in the set and with the coordinates shown.	☐	☐	☐	☐	☐	☐	☐	☐	
G2.05	Equipment interfaces	Nozzles and their orientation are consistent.	☐	☐	☐	☐	☐	☐	☐	☐	
G2.06	Tie-ins	Tie-in locations and references are identifiable and consistent.	☐	☐	☐	☐	☐	☐	☐	☐	
G2.07	Branches and connections	Correctly represented.	☐	☐	☐	☐	☐	☐	☐	☐	
G2.08	Slopes and drainage	Slopes, high and low points, vents and drains are shown where applicable.	☐	☐	☐	☐	☐	☐	☐	☐	
G2.09	Special geometry	Reducers, eccentric transitions, offsets and orientation-sensitive components are correct.	☐	☐	☐	☐	☐	☐	☐	☐	
G2.10	Supports and restraints	Locations and references are shown at the level needed for the release purpose.	☐	☐	☐	☐	☐	☐	☐	☐	
G2.11	Valve access and operation	Handwheels, levers and actuators can be reached and operated from grade or a platform, with clearance to operate them and to remove actuators. Chain operators are used only where the project permits them.	☐	☐	☐	☐	☐	☐	☐	☐	

ID	Check	Evidence / acceptance criterion	Applies to				Result				Comment
			R	M	C	F	PASS	FAIL	N/A	HOLD	
G2.12	Equipment maintenance and removal	Clearance is kept for exchanger tube bundle withdrawal, pump and motor removal, and removal of strainers, filters and other maintainable items. Piping stays out of the removal envelope; removable spools or break flanges are provided where needed.	☐	☐	☐	☐	☐	☐	☐	☐	
G2.13	Lifting provisions	Lifting beams, davits, monorails and crane access paths for equipment and heavy valves are not obstructed by the piping.	☐	☐	☐	☐	☐	☐	☐	☐	
G2.14	Access for inspection and instruments	Instruments, sample points, vents, drains and inspection or test points can be reached and read.	☐	☐	☐	☐	☐	☐	☐	☐	
G2.15	Access routes and headroom	Escape and access routes, walkways, headroom and platform clearances are free of obstruction.	☐	☐	☐	☐	☐	☐	☐	☐	
G2.16	Constructability	The line can be fabricated, transported and installed: field welds and fit-up allowances, spool size and weight for handling, installation sequence, and clearance for welding, bolting and testing are considered.	☐	☐	☐	☐	☐	☐	☐	☐	
G2.17	Interfaces with adjacent systems	Clashes and clearances with structure, other disciplines, insulation thickness and thermal movement are addressed or referred.	☐	☐	☐	☐	☐	☐	☐	☐	
G2.18	Model / drawing discrepancy	Material differences between model and drawing are resolved.	☐	☐	☐	☐	☐	☐	☐	☐	
GATE 2 ACCEPTANCE Geometry, access and interfaces are verified against approved design information. This gate does not replace stress, flexibility or support design, or a formal model, operability or constructability review.											

Gate 3 Components, materials and BOM

Applies to: R = Design review, M = MTO / procurement, C = Construction, F = Fabrication. **Result:** PASS / FAIL / N/A / HOLD.

ID	Check	Evidence / acceptance criterion	Applies to				Result				Comment
			R	M	C	F	PASS	FAIL	N/A	HOLD	
G3.01	Component identification	Fittings, valves, flanges and branches are identified.	☐	☐	☐	☐	☐	☐	☐	☐	
G3.02	Component specification	Consistent with the piping class and project requirements.	☐	☐	☐	☐	☐	☐	☐	☐	
G3.03	Rating and end connections	Pressure-temperature rating, facing and end type are correct.	☐	☐	☐	☐	☐	☐	☐	☐	
G3.04	Valve information	Type, size, rating, orientation and flow direction are shown.	☐	☐	☐	☐	☐	☐	☐	☐	
G3.05	Gaskets and bolting	Specifications are included where the deliverable requires them.	☐	☐	☐	☐	☐	☐	☐	☐	
G3.06	Welds and joints	Weld identification, joint details and special connections are shown.	☐	☐	☐	☐	☐	☐	☐	☐	

ID	Check	Evidence / acceptance criterion	Applies to				Result				Comment
			R	M	C	F	PASS	FAIL	N/A	HOLD	
G3.07	Material take-off	BOM/MTO descriptions, sizes, specifications and quantities are consistent with the drawing and the counting rules.	☐	☐	☐	☐	☐	☐	☐	☐	
G3.08	Item identification	Item numbers and material codes map to the catalogue or project system.	☐	☐	☐	☐	☐	☐	☐	☐	
G3.09	Special items	Instruments, inline equipment, specialty and vendor items are accounted for.	☐	☐	☐	☐	☐	☐	☐	☐	
G3.10	Exclusions and supply scope	Free-issue, vendor-supplied, site-supplied and excluded items are identified.	☐	☐	☐	☐	☐	☐	☐	☐	
G3.11	Quantity verification	An independent or automated quantity check is completed where applicable.	☐	☐	☐	☐	☐	☐	☐	☐	
GATE 3 ACCEPTANCE Components and material information are fit for the stated release purpose. A design-review isometric is not automatically an approved procurement or fabrication MTO.											

Gate 4 Drawing presentation and fabrication information

Applies to: R = Design review, M = MTO / procurement, C = Construction, F = Fabrication. **Result:** PASS / FAIL / N/A / HOLD.

ID	Check	Evidence / acceptance criterion	Applies to				Result				Comment
			R	M	C	F	PASS	FAIL	N/A	HOLD	
G4.01	Legibility	The drawing is legible at the issued size.	☐	☐	☐	☐	☐	☐	☐	☐	
G4.02	Dimension clarity	Dimensions are complete, unambiguous, and not duplicated or conflicting.	☐	☐	☐	☐	☐	☐	☐	☐	
G4.03	Symbols and legend	Symbols and legend are used consistently.	☐	☐	☐	☐	☐	☐	☐	☐	
G4.04	Continuations	Continuations are clearly referenced.	☐	☐	☐	☐	☐	☐	☐	☐	
G4.05	Weld and fabrication details	Weld numbers, field/shop designations and spool breaks are shown.	☐	☐	☐	☐	☐	☐	☐	☐	
G4.06	Coordinates and elevations	Present and consistent.	☐	☐	☐	☐	☐	☐	☐	☐	
G4.07	Notes and special instructions	Notes, installation instructions and inspection references are included.	☐	☐	☐	☐	☐	☐	☐	☐	
G4.08	Title block and status	Revision, issue status and approvals are complete.	☐	☐	☐	☐	☐	☐	☐	☐	
G4.09	Output integrity	The issued PDF is complete, opens correctly and matches the source.	☐	☐	☐	☐	☐	☐	☐	☐	
G4.10	Superseded information	Superseded information is not included in the release package.	☐	☐	☐	☐	☐	☐	☐	☐	
GATE 4 ACCEPTANCE The drawing is clear, complete and appropriate for the recipient and its intended use.											

Gate 5 Cross-document consistency and revision control

Note: An isometric can be internally consistent while still reflecting an outdated or conflicting design.

Applies to: R = Design review, M = MTO / procurement, C = Construction, F = Fabrication. **Result:** PASS / FAIL / N/A / HOLD.

ID	Check	Evidence / acceptance criterion	Applies to				Result				Comment
			R	M	C	F	PASS	FAIL	N/A	HOLD	
G5.01	P&ID consistency	Line identity, branches, valves, flow direction and process connections agree, allowing for differences in discipline representation.	☐	☐	☐	☐	☐	☐	☐	☐	
G5.02	Line list consistency	Line number, size, specification, service and design conditions agree.	☐	☐	☐	☐	☐	☐	☐	☐	
G5.03	Model consistency	Matches the authorised model or approved geometric source.	☐	☐	☐	☐	☐	☐	☐	☐	
G5.04	Revision consistency	Revisions and statuses of governing documents are checked for currency.	☐	☐	☐	☐	☐	☐	☐	☐	
G5.05	Change incorporation	Approved changes are incorporated into the drawing and material information.	☐	☐	☐	☐	☐	☐	☐	☐	
G5.06	Open discrepancies	Recorded, assigned, and resolved or formally dispositioned.	☐	☐	☐	☐	☐	☐	☐	☐	
G5.07	Downstream impact	Impact on associated isometrics, line lists, MTOs, supports and stress is assessed.	☐	☐	☐	☐	☐	☐	☐	☐	
G5.08	Change traceability	The governing source and evidence for material changes are identifiable.	☐	☐	☐	☐	☐	☐	☐	☐	
GATE 5 ACCEPTANCE Discrepancies are resolved or handled through an authorised process. Do not assume the newest revision number is technically correct; verify approval status and applicability.											

Gate 6 Technical review and outstanding actions

Applies to: R = Design review, M = MTO / procurement, C = Construction, F = Fabrication. **Result:** PASS / FAIL / N/A / HOLD.

ID	Check	Evidence / acceptance criterion	Applies to				Result				Comment
			R	M	C	F	PASS	FAIL	N/A	HOLD	
G6.01	Checker review	Checker review is completed and recorded.	☐	☐	☐	☐	☐	☐	☐	☐	
G6.02	Specialist reviews	Stress, materials, process, equipment and support reviews are complete or referenced.	☐	☐	☐	☐	☐	☐	☐	☐	
G6.03	Review comments	Review comments are addressed or dispositioned.	☐	☐	☐	☐	☐	☐	☐	☐	
G6.04	Post-check changes	Design changes made after the check have been reassessed.	☐	☐	☐	☐	☐	☐	☐	☐	
G6.05	Critical issues	No unresolved critical issue remains.	☐	☐	☐	☐	☐	☐	☐	☐	
G6.06	Exceptions	Exceptions are traceable to an authorisation.	☐	☐	☐	☐	☐	☐	☐	☐	
G6.07	Review evidence	Review evidence is retained.	☐	☐	☐	☐	☐	☐	☐	☐	
GATE 6 ACCEPTANCE Required reviews are complete and outstanding issues have an authorised disposition.											

Record Release Decision Record

Drawing no. / line no.		Revision	
Intended purpose	☐ Design review ☐ MTO / procurement ☐ Construction ☐ Fabrication ☐ As-built		
Decision	☐ Release ☐ Release with authorised exceptions ☐ Hold ☐ Reject		
Exceptions / outstanding actions	Reference, description, owner, authorisation reference and due date for each item.		
Checker	Name / signature	Date	
Authorised approver	Name / signature	Date	

Gate 7 Final release authorisation

Applies to: R = Design review, M = MTO / procurement, C = Construction, F = Fabrication. **Result:** PASS / FAIL / N/A / HOLD.

ID	Check	Evidence / acceptance criterion	Applies to				Result				Comment
			R	M	C	F	PASS	FAIL	N/A	HOLD	
G7.01	Mandatory gates	Mandatory gates are complete for the selected release purpose.	☐	☐	☐	☐	☐	☐	☐	☐	
G7.02	Failures and holds	No unresolved critical failures or holds prohibit release.	☐	☐	☐	☐	☐	☐	☐	☐	
G7.03	Exceptions	Exceptions are approved and traceable.	☐	☐	☐	☐	☐	☐	☐	☐	
G7.04	Status and revision	The correct document status and revision are assigned.	☐	☐	☐	☐	☐	☐	☐	☐	
G7.05	Checker and approver records	Checker and approver records are complete.	☐	☐	☐	☐	☐	☐	☐	☐	
G7.06	Controlled issue	The correct controlled document is issued to the intended recipients.	☐	☐	☐	☐	☐	☐	☐	☐	
G7.07	Previous issue	The previous issue is superseded or controlled.	☐	☐	☐	☐	☐	☐	☐	☐	

GATE 7 ACCEPTANCE Release proceeds only when the required checks are complete, discrepancies are resolved or formally dispositioned, and the release has been authorised.

Release decision rules

RELEASE	All checks for the intended purpose have passed, evidence is available and authorisations are complete.
RELEASE WITH AUTHORISED EXCEPTIONS	Only where the project procedure permits it. Exceptions are documented and approved, and no mandatory requirement is violated.
HOLD	Evidence is missing, an input revision is uncertain, a discrepancy is awaiting resolution, or an approval is outstanding.
REJECT	The drawing fails a required check. Correct and resubmit.

Limitations

- **Release stages differ.** Not every check applies at every stage; the project defines which checks are mandatory for each purpose.
- **Project requirements take precedence.** Where this checklist and project procedures differ, the project procedures govern.
- **A checklist is not a design calculation.** It does not verify stress, flexibility, hydraulics, support loads or pressure integrity.
- **Automated checks have limits.** They can flag discrepancies but cannot always tell which source is correct.
- **Exceptions need governance.** A recorded action is not acceptable simply because it has been recorded.

Feedback request

This draft is offered for review by practising piping designers, checkers and lead designers. Your comments, based on how isometrics are actually checked and released on your projects, will shape the next version. Please consider the following questions:

1. **Missing checks:** which checks are missing?
2. **Mandatory or project-dependent:** which checks should be mandatory, and which should depend on the project?
3. **Evidence:** what evidence is actually available in your CAD, PDM and document-control workflows?
4. **Responsibilities:** who checks, who resolves, and who authorises?
5. **Automation:** which checks could be automated, and which need engineering judgement?

Share your recurring checking comments

Which checking comments do you see again and again on isometrics? Please share anonymised examples, with no client, project or drawing details, through the contact page at pipingdesigners.com. They will inform a follow-up article on recurring isometric checking comments.

Status: Draft v0.1, ready for practitioner review; not approved as a project release procedure or validated industry guidance.

Contact and feedback: pipingdesigners.com

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