

ILLUSTRATED TECHNICAL HANDBOOK 03

OIL, GAS & INDUSTRIAL PIPING PROCUREMENT GUIDE

From line lists and material classes to coordinated products, inspections and complete delivery records.



AI-generated product illustration; not a documentary factory or shipment photograph.

METDAX INDUSTRIAL SUPPLY

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60 pages / 3 teaching cases / 6 fillable worksheets

START HERE

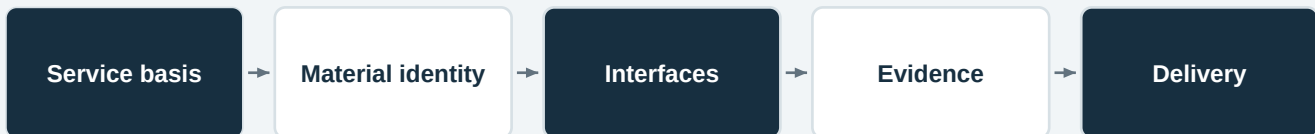
Purchase a defined piping package

A visual handbook for line pipe, plant piping and coordinated components.

Oil, gas and industrial piping orders begin with a service requirement and end with identifiable products, records and interfaces. A supplier needs more than a diameter and a price target. The buyer needs to preserve the engineering basis while turning line lists, material classes and drawings into a schedule that can be quoted, manufactured, inspected and received.

This handbook separates transmission or distribution line-pipe purchases, plant process-piping packages and maintenance replacement orders. It explains the procurement decisions shared by those routes and the inputs that differ. Six fillable worksheets cover project inputs, pipe items, connected components, inspection records, deviations and receipt. Three two-page teaching cases show quantities, evidence and changes together.

All product pictures are existing AI-generated METDAX concept images, not documentary factory or inspection photographs. Drawings, identifiers and case quantities are teaching examples. This publication is procurement guidance rather than a piping-design calculation, operating procedure or product certificate. The governing project documents establish the design and acceptance requirements; the accepted offer identifies the actual supplied product.



Original buyer workflow. Project requirements determine the actual review and release process.

A usable purchasing result

One controlled schedule links the product, quantity, preparation, required evidence and delivery identity. Keep each technical decision associated with its affected items.

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Find the service, product or purchasing task

Use the diagrams for orientation and the worksheets for your actual controlled project package.

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01 / PROJECT AND SERVICE

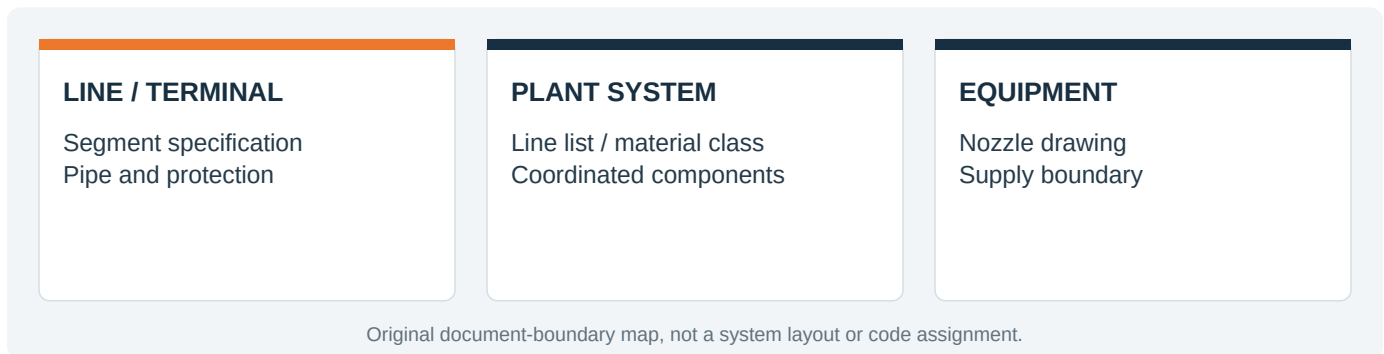
Locate the order within the project

Identify the line, facility and equipment boundaries before selecting products.

A project can connect a transmission line, terminal, plant distribution network and packaged equipment. The boundary between those systems affects which documents and responsibilities govern the purchase. Obtain the released project basis and identify the specific segment covered by the material order. A generic oil-and-gas label does not establish the applicable piping requirements.

Mark the buyer and supplier boundaries on the document set. Name the mating pipe, fitting, valve or equipment connection at each boundary, and identify who supplies it. If the scope includes fabrication, distinguish supplied pipe from completed spools. If it includes coating, distinguish factory treatment from field-joint work. This makes a mixed package reviewable before it is priced.

The conceptual map below is an interface checklist, not a pipeline layout. It does not determine which code applies, the size of a line or the capability of equipment. Use the actual project drawings and engineering decisions to complete the procurement schedule.



Boundary	What the buyer should identify
Pipeline / terminal	Governing segment and connected product references
Plant / equipment	Line class, nozzle drawing and supply responsibility
Supplier / site	Preparation, treatment and field work included or excluded

Start with scope

State the physical deliverable and governing document references before combining products into a package.

01 / PROJECT AND SERVICE

Line pipe and process pipe need different schedules

A pipeline joint list and a plant material class organize different purchases.

A line-pipe order commonly emphasizes the approved line specification, grade, product specification level, route, direct dimensions, joint lengths, protection and lot records. A process-piping package commonly uses a line list and piping material class to coordinate pipe, fittings, flanges, valves and related components. The exact requirements come from the project, not from those general patterns.

Do not transfer a plant component class to a transmission-pipe order without review, or assume that a line-pipe grade specifies an entire refinery package. Keep the service, document and item references visible. A supplier may quote several families, but each needs the product description and evidence appropriate to its role.

Use a separate schedule section when the order includes utilities, pressure piping, structural pipe or fabrication blanks. Similar dimensions can conceal different product specifications and tests. An explicit application grouping helps prevent an incorrect item from being substituted during quotation or delivery.

LINE-PIPE ORDER

Grade / PSL / condition
 OD / wall / joint lengths
 Protection / lot records

PROCESS-PIPE PACKAGE

Line class / drawings
 Pipe + connected products
 Interfaces / evidence

Use the actual project basis; these are purchasing patterns, not design rules.

Organizing principle

Group by governing specification and application first. Then sort by material identity, dimensions, preparation and delivery lot.

01 / PROJECT AND SERVICE

Collect a line list that explains the requirement

Use process and design inputs as controlled references, not guessed material choices.

The line list identifies the line, service, design basis and material-class reference used by the project. Obtain its released version and preserve line numbers when preparing the material schedule. Design pressure and temperature are inputs to the responsible engineering decision; they do not independently authorize a buyer to choose a pipe wall or a flange class.

Collect relevant medium, operating range, exposure, minimum temperature and any special-service information identified by the project. Identify which values are preliminary and who owns their confirmation. For a mixed facility package, a material-class or zone change should remain visible even where nominal pipe sizes are the same.

The procurement schedule does not need to duplicate every process document. It needs the correct references and product requirements derived from the approved basis. Keep a technical-question register for gaps and conflicting inputs so a preliminary enquiry does not silently become a final order.

Line-list input	Why procurement needs it	Decision owner
Line / service reference	Links items to the correct application	Project engineering
Design basis / conditions	Locates the governing approved selection	Responsible engineer
Material class / revision	Defines the coordinated component requirements	Piping engineering
Special conditions	Identifies additional material / evidence questions	Engineering / materials
Quantity / destination	Defines the physical and delivery package	Procurement

Useful enquiry wording

Please confirm the released line-list and material-class references and identify the person authorized to resolve the open technical inputs.

01 / PROJECT AND SERVICE

Read a piping material class as a component system

The class identifier is a project reference, not a universal material code.

A piping material class can coordinate pipe, fittings, flanges, valves, bolting, gaskets and other components for a specified service basis. Its identifier and internal format are project-specific. Ask for the actual class sheet and revision; do not interpret an unfamiliar class code from a supplier catalogue or another project.

Translate the class into separate component lines while preserving the references. A pipe grade does not specify a valve trim or gasket. A flange class does not establish the pipe wall. A common nominal size does not settle the nozzle interface. Use the class and drawings to identify the exact product requirements and obtain clarification where the document leaves an option open.

A supplier should answer the class requirements with actual offered identities and exceptions. Ask for differences to be listed item by item. The final order should show the accepted component combination and supporting evidence, so a receiving team can reconcile the package without interpreting the original engineering shorthand.

PIPE

Material and geometry

FITTINGS

Type and end arrangement

FLANGES

Type, facing and bore

VALVES

Configured product

JOINT MATERIALS

Gaskets and bolting

DOCUMENTS

Identity and evidence

The actual project class sheet supplies the requirements for each component.

Decode; do not invent

Retain the released class sheet. Use the component map to identify missing purchasing fields and the document that supplies each answer.

01 / PROJECT AND SERVICE

Control the hierarchy of governing documents

Design codes, product specifications, drawings and purchase notes serve different roles.

ASME publishes distinct B31 code scopes for process piping, pipeline transportation of liquids and slurries, and gas transmission and distribution. Those public scopes help locate the subject of a requirement. The responsible project team determines the applicable code and edition for the actual system. Procurement should record that decision rather than assign it from a product name.

A product specification describes the ordered material or component; a dimensional reference describes a geometry system; a drawing defines a particular interface or assembly. The purchase order adds agreed scope and commercial terms. Establish document precedence and record conflicts before release. A purchasing note should not quietly override a design requirement.

Create an attachment register with title, number, edition or revision, status and affected items. When a document changes, identify which file is superseded and whether product identity, preparation, inspection or quantity changes. The supplier acknowledgement and receiving file should use the same governing set.

SYSTEM BASIS	PRODUCT BASIS	ORDER BASIS
Code / project documents	Specification / dimensions	Accepted scope / revisions
Resolve conflicts through the responsible reviewer; no product name assigns a design code.		

Public code scope example	Procurement action
B31.3 / process piping	Preserve the project-assigned code and material-class basis
B31.4 / liquids and slurries	Identify the governing pipeline segment and order documents
B31.8 / gas systems	Preserve the assigned requirements and specified edition

Scope reference only

The code names below are not a determination of jurisdictional adoption or a design approval.

Source scope: G01, G02, G03 | Reference register: page 59

02 / PRODUCT AND SERVICE REQUIREMENTS

Map the product standard before choosing a route

Use the exact specification, grade and condition for the purchased item.

The public titles distinguish several common product families. API 5L concerns line pipe; A106 concerns seamless carbon steel pipe for high-temperature service; A335 concerns seamless ferritic alloy-steel pipe for high-temperature service; A312 concerns austenitic stainless pipe in its specified manufacturing forms. These scope labels do not establish the acceptability of a product for every service.

Record the specified edition, grade, delivery condition, dimensions and supplements. Keep the material family separate from coatings, preparation and certification requirements. If the project permits several manufacturing routes, show the offered route explicitly. If it fixes a route, preserve the requirement unless an authorized alternative is accepted.

The comparison table is a location aid for procurement. It does not reproduce the specifications or authorize substitution between rows. Use the governing project requirements and the actual offered product records to complete the compliance review.

Product family	Public scope orientation	Complete the order with
API 5L	Seamless and welded line pipe	Grade, PSL, condition, route and supplements
ASTM A106	Seamless carbon steel pipe	Grade, edition, condition and project basis
ASTM A335	Seamless ferritic alloy-steel pipe	Exact alloy grade and delivery requirements
ASTM A312	Austenitic stainless pipe	Grade, route, dimensions and required finish
Dimensional reference	Geometry system, not material approval	Controlling OD / wall / schedule basis

Release rule

A generic phrase such as carbon steel, alloy pipe or stainless pipe is not a complete purchasing identity.

Source scope: G04, G06, G07, G08 | Reference register: page 59

02 / PRODUCT AND SERVICE REQUIREMENTS

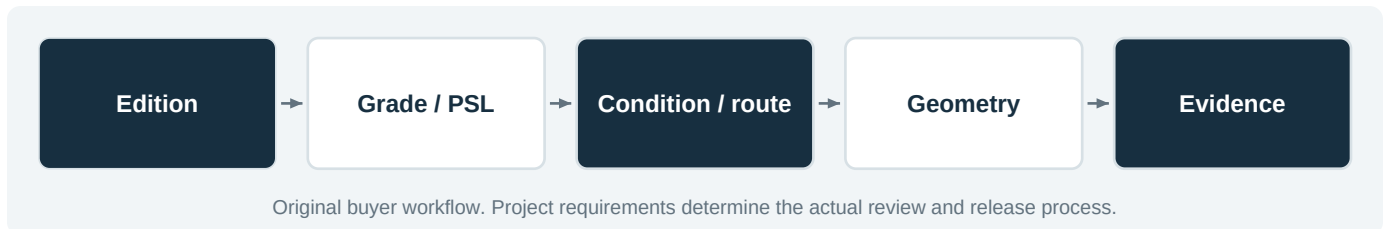
Build the API 5L item as a full specification

Grade, PSL, condition, dimensions and evidence belong together.

API announced the 47th edition of Specification 5L on 2 June 2026. The specification addresses manufacture, inspection, testing, marking and traceability of line pipe. Publication status, the project-required edition and applicable licensing transition requirements are separate checks. State the required edition in the enquiry and ask the supplier to identify the basis of its offer.

A full line-pipe description includes grade, required product specification level, delivery condition, manufacturing route where specified, OD, wall, length arrangement, ends and protection. Identify service supplements and records rather than relying on the general phrase API pipe. The project engineer establishes the technical requirements; the supplier confirms the offered product and evidence.

If the order requires API Monogram licensing or marking, verify the actual manufacturer and facility scope through the official Composite List and applicable program information. Keep that check distinct from material-test results. A reference to API 5L alone is not evidence that a facility holds a particular license or that all offered products are covered.



Offer review

Require the requested and offered identities to be stated explicitly, with any edition, grade, PSL or route difference listed as a deviation.

Source scope: G04, G05 | Reference register: page 59

02 / PRODUCT AND SERVICE REQUIREMENTS

Review PSL as a required product level

Do not use a general quality score in place of the ordered requirements.

The product specification level is part of the API 5L description. The project requirement determines which level and supplements apply. Compare the offered compliance with the specified edition and actual item requirements. Do not infer that a stated PSL automatically addresses every special-service condition, project test or documentary obligation.

Ask which required material, manufacturing, inspection and record provisions the offer includes. A buyer can use a requirement-to-evidence matrix to make that answer visible without reproducing proprietary clauses. Separate standard-required checks from project additions. Confirm their applicability, sampling or extent, record format and review stage through the responsible specification.

If a supplier proposes a different level, record the exact change and reason. The technical reviewer assesses the offered product against the intended service and project documents. Procurement then records the accepted result and any commercial consequences. An approval for one item is not a blanket change for a mixed line-pipe schedule.

Review group	Question for the offered item
Identity	Does grade, PSL, route and condition match the ordered basis?
Standard / supplements	Which required provisions and project additions apply?
Checks / extent	What methods, sampling and stages are agreed?
Records	Which issued documents demonstrate the required checks?
Difference	Who reviewed any change and what conditions apply?

Use the authorized specification

This worksheet approach does not replace a clause-by-clause compliance review where the project requires one.

02 / PRODUCT AND SERVICE REQUIREMENTS

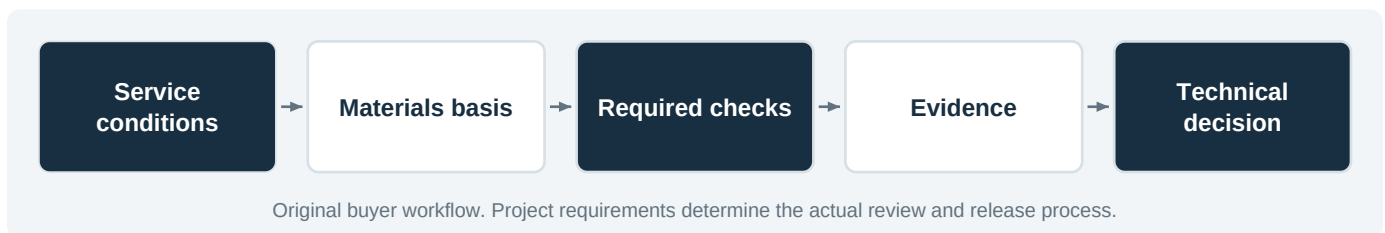
Identify specialist service questions early

Material selection needs the actual environment and an accountable reviewer.

Low-temperature, corrosive, sour, cyclic or other specialist service can require additional material and evidence decisions. Collect the specific conditions identified by engineering, not only a short label such as sour-service pipe. AMPP provides resources for MR0175 / ISO 15156; the applicable materials basis and its scope still need to be established for the actual application.

For a service involving H₂S, CO₂, hydrogen or other specified media, ask the materials and process reviewers which composition, moisture, temperature, pressure, transients and other inputs govern selection. This handbook gives no service threshold, alloy qualification or universal substitution rule. It helps procurement preserve the reviewed requirements and request the corresponding product records.

Do not assume that a higher PSL, a stainless family name, a generic NACE claim or an isolated test resolves the complete requirement. State the exact applicable documents, supplements and evidence. If inputs remain preliminary, request a technical review on that basis before a final product is released.



Special-service order fields

Application and conditions + applicable document and edition + required product identity + supplements + evidence and review responsibility.

Source scope: G15 | Reference register: page 59

03 / MANUFACTURING ROUTES

ERW / HFW: specify the product and permitted route

A manufacturing name cannot establish the service capability by itself.

A longitudinal welded-pipe purchase needs the applicable product specification, grade, permitted manufacturing route and delivered condition. The route description explains part of the manufacturing process; it does not provide a universal working-pressure or service rating. When the project uses a specific process designation, retain it in the offer comparison.

Compare dimensions, length arrangement, ends, protection and required evidence on the same basis. Ask how any downstream cutting or preparation preserves identity and records. A supplier may offer the same visible pipe shape under different product specifications. The material schedule must identify which actual product is required and offered.

The concept image illustrates finished pipe, not the production history or inspected condition of an offered lot. Use the manufacturer records and accepted order for those questions. A proposed route change should identify all affected requirements and be reviewed before manufacture.



AI-generated concept illustration; not a factory, inspection or shipment photograph.

WHAT TO CONFIRM

- 1 Standard / grade / route
- 2 Specified dimensions
- 3 Prepared condition
- 4 Required lot records

A complete route comparison

Keep product identity, geometry, processing and evidence visible. Do not compare route names as though everything else were equal.

03 / MANUFACTURING ROUTES

LSAW and SSAW: compare permitted seam arrangements

The specification and project basis govern which offered route is acceptable.

Longitudinal and spiral submerged-arc-welded pipe use different seam arrangements. Their purchasing review should identify the specified route, grade, dimensions, delivered condition and inspection basis. The route alone does not determine which product is suitable for a project. Use the actual approved line specification to establish the permitted combinations.

For an allowed alternative, compare the complete product and records. Check end preparation, coating, dimensional requirements, additional inspection and delivery scope. Large pipe can also change support, handling and shipment planning. Those practical items should appear in the offer rather than be hidden inside a general welding-route description.

The original seam diagram identifies arrangements only. It provides no relative performance ranking or acceptance geometry. Record a proposed difference against the buyer item and obtain the responsible decision, then carry the agreed route into the purchase order and final records.



LONGITUDINAL SEAM



SPIRAL SEAM



SEAMLESS CONCEPT

Schematic arrangements only. Product and project requirements determine acceptance.

Compare	Resolve on the same basis
Product identity	Standard, edition, grade and required condition
Geometry / preparation	OD, wall, length, ends and protection
Evidence	Required examinations, records and traceability
Delivery	Handling, packing and physical quantity arrangement

Avoid a false comparison

A bare-pipe offer and a coated, prepared, inspected package differ in more than their welding route.

03 / MANUFACTURING ROUTES

Seamless, alloy and stainless purchases

Order the exact material condition and downstream requirements.

A seamless product still requires a governing specification, grade, delivered condition, geometry and inspection basis. Alloy and stainless family names do not complete those fields. The project basis determines which product is required. For fabrication or machining, identify the condition and dimensional allowance needed by the downstream operation.

A nominal pipe wall can serve a standard pipe order without describing a machining allowance or controlled bore. If the purchased object is a component blank, use the approved drawing and inspection arrangement. Separate that item from ordinary pipe in the schedule. Ask the supplier to state how material identity follows any later preparation.

The illustration shows a product form, not its chemistry, heat treatment or qualification. Review actual offered records. A change from welded to seamless, or between different material standards, remains a product change even if the external dimensions are the same.



AI-generated concept illustration; not a factory, inspection or shipment photograph.

WHAT TO CONFIRM

- 1 Exact specification / grade
- 2 Required delivery condition
- 3 Pipe or component blank
- 4 Records for the actual lot

Selection output

Material identity + condition + geometry basis + preparation + required records. Keep the document establishing each requirement.

04 / DIMENSIONS AND QUANTITIES

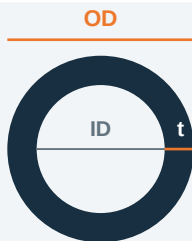
Read the nominal size and physical geometry

Keep NPS / DN, OD, wall and bore in their proper roles.

NPS and DN are nominal designations; OD is a physical outside diameter. ASME B36.10 describes the dimensional standardization of wrought steel pipe. A nominal two-inch pipe designation is not the same as an actual 2.000 in. tube OD. State the dimensional basis so the supplier and connected-component buyer identify the same geometry.

The short reference below uses four size facts checked against an original manufacturer chart. It is a reading example, not a full dimensional catalogue or METDAX availability statement. Use the approved dimensional reference and controlling unit system for the order. A rounded metric companion should not become a second conflicting acceptance limit.

For a bore-sensitive component, identify whether ID is a controlled requirement. The ideal arithmetic $ID = OD - 2 \times \text{wall}$ is useful for understanding geometry but is not a guarantee of actual bore. Record tolerances and the check method where fit is critical.



OD: physical outside diameter
 t: wall thickness
 $ID = OD - 2 \times t$: ideal arithmetic
 NPS / DN: nominal designations

Not to scale. Actual dimensions and tolerances follow the ordered requirements.

NPS	DN	OD (in.)	OD (mm)
1	25	1.315	33.4
2	50	2.375	60.3
3	80	3.500	88.9
4	100	4.500	114.3

Interface question

Which actual OD, wall and bore arrangement does the mating fitting or equipment require?

Source scope: G09, G10 | Reference register: page 59

04 / DIMENSIONS AND QUANTITIES

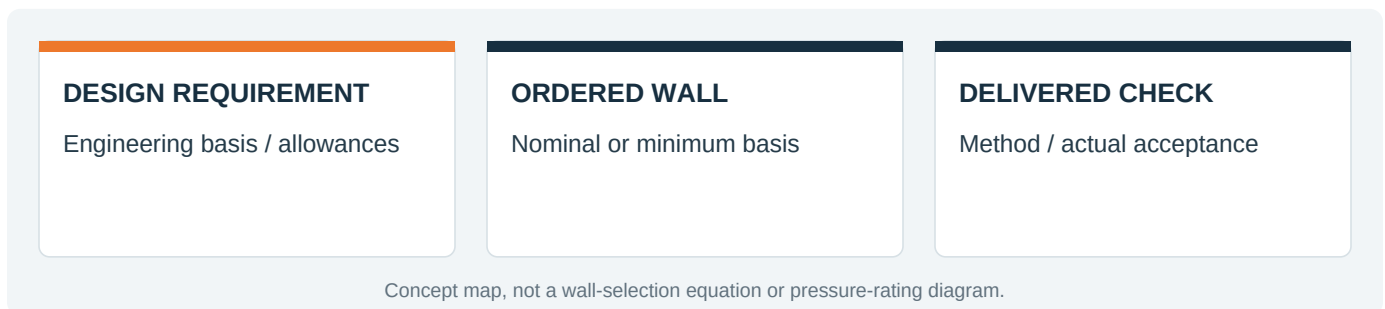
Separate nominal wall from required remaining thickness

Design allowances and product variation need an approved purchasing basis.

A nominal wall designation, a minimum required thickness and a measured delivered wall are different values. The responsible engineering calculation establishes the design requirement and applicable allowances. Procurement orders the approved nominal or minimum-wall basis under the specified product requirements; it should not select wall from a remembered universal tolerance.

Record which variation and measurement requirements govern the product. Different specifications can use different rules. Additional machining, threading, grooving or other preparation can affect the required delivered geometry. Identify critical interfaces and inspection stages. An accepted thicker-wall proposal can still change bore, mass and fabrication fit.

The conceptual wall map explains which questions must be coordinated. It is not a thickness-design formula and provides no pressure capability. If the buyer has an approved minimum requirement, ask engineering to identify the purchase value and governing acceptance basis explicitly.



Value / decision	Record its source
Design-required basis	Approved engineering requirement and allowances
Ordered wall	Nominal / minimum / drawing basis, controlling unit
Permitted variation	Applicable product specification or additional requirement
Delivered check	Method, location, result and acceptance reference

Receiving decision

A wall measurement becomes reviewable when the requirement, method and affected product are recorded together.

04 / DIMENSIONS AND QUANTITIES

Define piece lengths and order units exactly

Reconcile count, length and mass without changing the physical product.

Choose the purchasing quantity basis: pieces, total length or a defined mass unit. Then specify fixed lengths, a cut schedule or an agreed random-length arrangement. The same total length supplied in different piece lengths can change fabrication yield, handling and spare requirements. Keep those choices visible in the RFQ and quotation.

NIST identifies the international foot as exactly 0.3048 m. Consequently, 20 ft equals 6.096 m, not 6.000 m. If both units are displayed, state which controls. Do not combine two nearly matching lengths into an ambiguous label such as 6 m / 20 ft. Preserve exact conversions separately from manufacturing tolerances.

For mass-based offers, name the unit and whether theoretical or measured mass governs. Report the physical pieces and length arrangement for receipt as well. Cutting should preserve the agreed material identity, and remnant inclusion should be explicitly stated where it matters.

Quantity basis	Complete description	Check
Fixed pieces	Count x exact ordered length	Piece count and total length
Total length	Total plus allowed piece arrangement	Physical lengths and balance
Cut schedule	Part marks, lengths and counts	Drawing revision and remnants
Mass	Defined unit and calculation / weighing basis	Product count and excluded additions
Dual units	Controlling value and reference conversion	No conflicting rounded limit

Before comparison

Normalize the accepted physical quantity first. A price per metre, per piece and per tonne cannot be compared without a stated common basis.

Source scope: G11 | Reference register: page 59

04 / DIMENSIONS AND QUANTITIES

Estimate bare-pipe mass with visible assumptions

Use a geometry calculation for planning, not as a shipment certificate.

For an ideal circular section with OD D and wall t in millimetres, metal area is $\pi \times t \times (D - t)$ square millimetres. With an explicitly assumed density of 7,850 kg/m³, mass per metre is $\pi \times 7,850 / 1,000,000 \times t \times (D - t)$. The rounded coefficient is about 0.02466. This independently derived estimate is not a guaranteed actual mass.

The teaching input below is dimension-based: OD 323.9 mm, wall 9.50 mm and piece length 12.000 m. It is not presented as a catalogue schedule designation. The result excludes dimensional variation, prepared ends, coating, attachments and packing. Keep the controlling inputs and calculation precision in the working sheet.

Use the contractually agreed theoretical table or weighing basis for invoicing. Recalculate when geometry or quantity changes, and request confirmed shipment information for transport. A mass estimate does not establish a pressure or structural design.

$$m = \pi \times \rho / 1,000,000 \times t \times (D - t) \text{ kg/m}$$

D and t in mm; assumed $\rho = 7,850 \text{ kg/m}^3$; rounded coefficient = 0.02466.

Teaching input / result	Value
OD / wall	323.9 mm / 9.50 mm
Density assumption	7,850 kg/m ³
Bare mass per metre	About 73.66 kg/m
One 12.000 m piece	About 883.91 kg
80 pieces / 960.000 m	About 70,712.62 kg of ideal bare steel

Calculation status

All numerical outputs use the stated ideal geometry and density assumption. They are planning examples, not actual lot or freight records.

04 / DIMENSIONS AND QUANTITIES

Keep order mass, shipment mass and price basis separate

A package contains more than ideal bare pipe.

Theoretical bare-metal mass can support quantity checks, but a shipment can include coating, caps, fittings, supports, bundles and other packing. Identify which mass the price and delivery records use. A supplier may invoice on a defined theoretical basis while reporting measured gross mass for transport. The two values answer different questions.

Record physical quantities alongside any mass total. For a split shipment, identify the item and lot balance so a weight-based figure does not conceal a missing piece or changed length. Confirm whether accessories are inside the pipe price, quoted separately or excluded. A comparison sheet should keep those boundaries visible.

Obtain confirmed shipment weights, dimensions and packing arrangement before making transport commitments. This handbook provides no freight capacity, lifting selection or carrier limit. Its purpose is to help the buyer request and reconcile the actual information needed by the responsible logistics team.

BARE-PIPE ESTIMATE Ideal geometry / density	INVOICING BASIS Agreed table or weighing	SHIPMENT RECORD Actual products and packing
Physical counts and exact lengths remain part of every reconciliation.		

Mass / quantity term	Agree the basis
Theoretical bare pipe	Geometry / table and density assumptions
Invoicing mass	Specified calculation or weighing convention
Shipment net / gross	Included products and packing; confirmed records
Physical quantity	Pieces, exact lengths, sets and accessories

Commercial clarity

A converted unit price should state its quantity basis and exclusions. Preserve the original quotation values for review.

05 / COMPONENT INTERFACES

Specify a prepared butt-welding end

The approved end detail controls the delivered geometry.

ASME B16.25 addresses preparation of butt welding ends, including bevels and related internal or external shaping. Use the project-required reference or drawing for the actual material and wall combination. The standard scope is not a universal bevel angle or welding procedure for every pipe order.

Record whether preparation applies to both ends or a drawing-specific arrangement. Identify coating cutback boundaries, required surface condition, end protection and the records demonstrating the prepared feature. If preparation is performed by a separate processor, preserve the connection to the base material and lot documents.

The image shows a bevelled component concept. It explains where an interface exists but gives no acceptance dimension. The fabricator uses the approved detail and applicable procedures. Changes to wall or mating geometry should be reviewed with the end preparation, rather than treated as a material-only change.



AI-generated concept illustration; not a factory, inspection or shipment photograph.

WHAT TO CONFIRM

- 1 Approved end detail
- 2 Material / wall match
- 3 Treatment boundaries
- 4 Inspection and protection

A useful RFQ field

End-preparation specification or drawing number / revision + affected ends + inspection record + agreed protection.

Source scope: G12 | Reference register: page 59

05 / COMPONENT INTERFACES

Build a butt-weld fitting schedule

Type, end sizes, geometry, material and wall basis should be explicit.

An elbow, tee or reducer needs a complete component identity. Record the governing product and dimensional requirements, material grade, end sizes, wall basis, configuration and quantity. A fitting described only by nominal size can leave radius, reduction arrangement or connection preparation unresolved.

For a reducer, identify both end sizes and the required concentric or eccentric arrangement. For an elbow, retain the project-defined angle and geometry series. For a fabricated transition, use a drawing with critical features and revision. The exact dimensions and permitted variations come from the selected requirement; do not infer them from a catalogue photograph.

Coordinate the fitting ends with pipe and equipment. A change to pipe wall can require a review of the mating component or end transition. Preserve the accepted combination in the material schedule and inspection plan. The concept images explain forms, not certified dimensions or currently available models.



Elbow concept: record angle, geometry series and end requirements.



Reducer concepts: record both end sizes and required arrangement.

AI-generated product illustrations. No product approval or inspected-lot evidence is implied.

Interface record

Associate each fitting line with its pipe class, connected items and applicable drawing or dimensional reference.

05 / COMPONENT INTERFACES

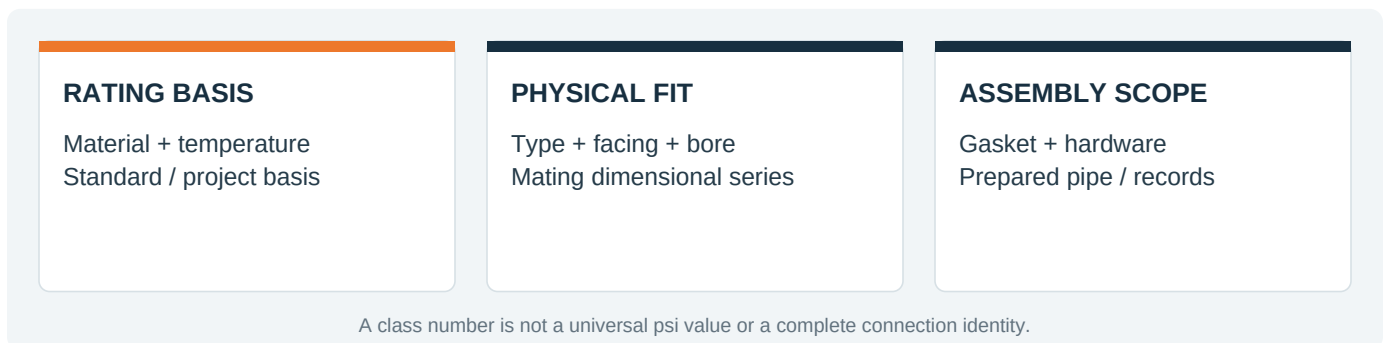
Read flange class with material and temperature

A class designation is not a stand-alone working-pressure value.

ASME B16.5 addresses pipe flanges and flanged fittings, including pressure-temperature ratings, materials and dimensions. A class designation must be considered with the applicable material, temperature and standard basis. Procurement should preserve the engineer-selected requirement; it should not equate a class number with the same numerical pressure in psi.

A flange order also needs type, size, material, facing, bore or matching wall basis, connection preparation and applicable records. Confirm the mating component dimensional series. A larger class number does not automatically establish interchangeability with an existing nozzle or flange; geometry and the complete assembly still need review.

The diagram keeps rating basis, physical fit and assembly components separate. It is not a pressure-rating table. Use the authorized project and selected-product documents to determine the actual required values and supporting evidence.



Flange decision	Preserve in the purchase
Rating basis	Applicable standard / edition, material and design conditions
Physical configuration	Type, size, facing, bore and matching interfaces
Assembly scope	Gasket, bolting and installation responsibility
Evidence	Required identity, inspection and manufacturer records

Avoid a shorthand error

Class number, pipe schedule and material grade identify different requirements. Keep all three where the project requires them.

Source scope: G13 | Reference register: page 59

05 / COMPONENT INTERFACES

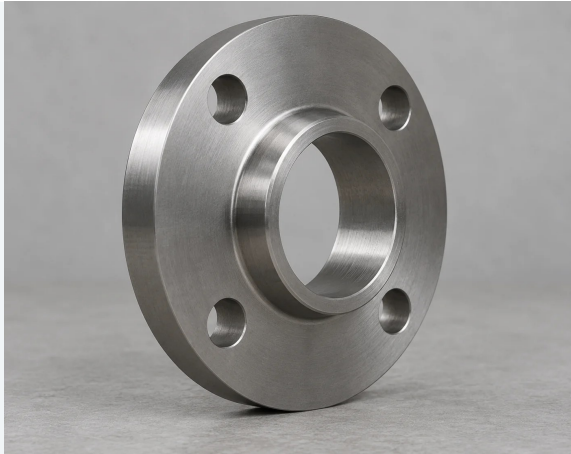
Check the complete flanged connection

Faces, bores, holes, gasket and hardware must belong to the accepted interface.

Identify the mating flange or equipment-nozzle drawing and compare the actual dimensional series, size, facing and bore arrangement. A nominal size alone does not establish fit. For a welding-neck or other prepared component, coordinate the pipe-wall or end-transition requirements with the approved drawing.

Record the gasket and bolting specifications established by the project. State which components are supplied and which are provided by another party. Keep protection of mating faces and identification in the packing plan. Where special checks are required, identify the feature, method and record rather than the vague phrase precision flange.

The gallery illustrates flange body and facing concepts. Hole count, surface texture and proportions in an AI illustration are not acceptance values. Use actual component drawings and records. An approved component substitution should update the linked interface schedule and receiving checks.



Body and hub concept: confirm the real bore and mating dimensions.



Facing concept: use the specified face and surface requirements.

AI-generated product illustrations. No product approval or inspected-lot evidence is implied.

Connected-scope check

Flange + mating reference + gasket + bolting + prepared pipe + required records. Identify the agreed party for each part.

05 / COMPONENT INTERFACES

Define the industrial valve configuration

Function, body, internals, ends and operator form one purchasing identity.

A valve purchase needs the project-defined function and exact offered configuration. Record type, size, rating basis, end connections, body material, specified trim or wetted materials, operator and relevant accessory requirements. ASME B16.34 has a scope including valve pressure-temperature ratings and other product requirements; the project determines the applicable basis.

A family datasheet may describe several body, trim or operator options. Highlight the actual offered combination and list exceptions. Confirm the connected flange or weld interface and required records. A familiar valve type or a general materials label does not establish suitability for the stated medium and design conditions.

The two concepts identify external product families. They do not show a verified internal trim or accepted pressure rating. Compare the actual configured offer with the line class and application. Keep proposed changes to materials, seats, operator or ends visible for technical review.



Ball-valve concept: order the actual body, trim, ends and operator.



Gate-valve concept: preserve the configured product and records.

AI-generated product illustrations. No product approval or inspected-lot evidence is implied.

Valve description

Function + type / model + size + rating basis + materials / trim + ends + operator / accessories + evidence.

Source scope: G14 | Reference register: page 59

05 / COMPONENT INTERFACES

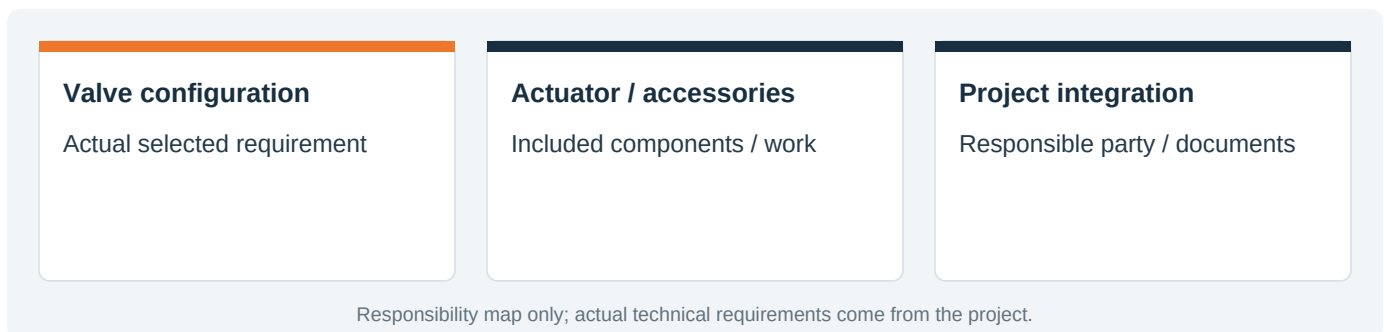
Coordinate actuation and accessory responsibility

Mechanical product, control interface and project integration are separate scope fields.

If an actuated or monitored valve is specified, obtain the project requirements and exact configured product information. Identify the actuator, accessories, control interfaces, required environmental or other evaluations, and the responsible integration party. Procurement should not select a control or protection configuration from a generic valve photograph.

The enquiry should state what is included in the mechanical package and what remains with the controls or installation team. Request the selected instructions and drawings, not only a family brochure. Record required review or test documents and their relationship to the configured item. A change of actuator or accessory can affect more than price.

The responsibility map below is a purchasing coordination tool. It provides no wiring, fail-position, operating or commissioning instruction. The responsible technical documents establish those requirements. Keep configuration decisions and accepted interfaces together in the final order dossier.



Package field	Required clarity
Mechanical item	Actual body, ends, materials and operator
Control / accessories	Exact included products and interface requirements
Integration	Responsible party and governing instructions
Evidence / verification	Required records for the configured product

Change-control trigger

A component option that changes function, interface or required evidence should be reviewed as a configured-product change.

05 / COMPONENT INTERFACES

Use equipment-nozzle drawings for the connection

Match the specified ports and geometry; do not select equipment from a pipe size.

A pump or packaged-equipment boundary needs the actual selected nozzle or port drawing. Record the connected line reference, size series, facing, orientation, elevation or other relevant geometry, and included connection components. The equipment specification and engineer-selected duty govern the machine; pipe diameter alone does not select it.

Identify who supplies transitions, mating flanges, gaskets, hardware and supports or related site work. If a nozzle revision changes the connection, identify affected components and drawings before fabrication. The dimensional and material checks should use the latest accepted equipment information.

The pump-port image is conceptual and is not a performance curve, selected model or installation record. It helps explain the interface question. Obtain actual OEM or selected-manufacturer drawings and documentation for the order package, and retain the review outcome with the connected component lines.



AI-generated concept illustration; not a factory, inspection or shipment photograph.

WHAT TO CONFIRM

- 1 Selected equipment drawing
- 2 Port / facing / orientation
- 3 Mating components
- 4 Supply responsibility

Interface release

Do not fabricate a transition from an approximate catalogue image. Use the agreed dimensional and material references.

06 / PROTECTION AND SITE INTERFACES

Separate internal and external protection

The medium and exposure can impose different treatment requirements.

State the base pipe product and the protection scope independently. Internal coating or lining relates to the specified service and project requirements; external treatment relates to the exposure and agreed system. A general phrase coated pipe leaves the treatment identity, preparation, boundaries and required records unresolved.

Collect the relevant environmental inputs through engineering and identify the selected protection specification. Include factory work, prepared ends, field-joint treatment and permitted repairs. A changed protection system should be compared on its actual application, preparation, inspection and maintenance basis rather than its colour or a generic lifetime claim.

The concept gallery illustrates external treatment and an internal surface. It does not establish chemical compatibility, thickness or service life. Use the actual specified system and product records. Keep treatment boundaries tied to item references and drawings, especially where site work follows manufacture.



External-treatment concept: identify the real system and boundaries.



Internal-surface concept: verify the service and lining requirements.

AI-generated product illustrations. No product approval or inspected-lot evidence is implied.

Complete treatment description

Base product + internal / external scope + specification + preparation + boundaries + inspections + repairs and delivery protection.

06 / PROTECTION AND SITE INTERFACES

Coordinate coating cutbacks and field joints

Factory protection ends where another controlled operation begins.

A coated-pipe order can leave an end region for welding or another prepared connection. Define that boundary through the actual protection and end-detail requirements. The cutback length, termination condition and later field-joint treatment are project-specific. This guide intentionally gives no universal cutback dimension.

Name the party responsible for factory treatment, bare-region protection, field work and permitted repairs. State how finished interfaces will be protected during transport and which checks occur at each stage. A late change to bevel, wall or connection can affect treatment boundaries and inspection records.

The conceptual layer sketch and cutback image explain the boundary only. They are not a complete coating design or production record. Use the selected system instructions and approved drawings for actual values. Preserve the product identity through treatment so the final documents remain associated with the delivered pipe.



AI-generated concept illustration; not a factory, inspection or shipment photograph.

WHAT TO CONFIRM

- 1 End-detail reference
- 2 Treatment termination
- 3 Field-joint responsibility
- 4 Protection / inspection

No boundary gap

Record who completes the interface treatment and which document demonstrates its acceptance. Keep that work distinct from the base-pipe supply.

06 / PROTECTION AND SITE INTERFACES

Specify coating checks by system and stage

An instrument picture is not evidence of a performed or acceptable test.

The protection specification should identify surface preparation, application, thickness or other checks, repair requirements and records appropriate to the selected system. Agree stages, extent and responsible parties. A test name without an applicable method and acceptance basis is insufficient for a reviewable inspection plan.

For checks such as film thickness or discontinuity detection, the selected system and applicable requirements establish methods, settings, locations and acceptance. Procurement should request those references and records, not infer them from a rendered instrument or another product. Identify which checks are completed before the final surface is no longer accessible.

Both pictures are AI-generated concepts. They show different inspection discussions, not actual METDAX measurements or instructions for equipment use. Order-specific reports should identify product, method, results, review and disposition. Keep repaired areas and any required rechecks traceable.



Thickness-check concept: record the actual method and requirement.



Discontinuity-check concept: use the selected system basis.

AI-generated product illustrations. No product approval or inspected-lot evidence is implied.

Inspection plan fields

Check / stage / method / required extent / acceptance reference / product identity / report / reviewer and disposition.

06 / PROTECTION AND SITE INTERFACES

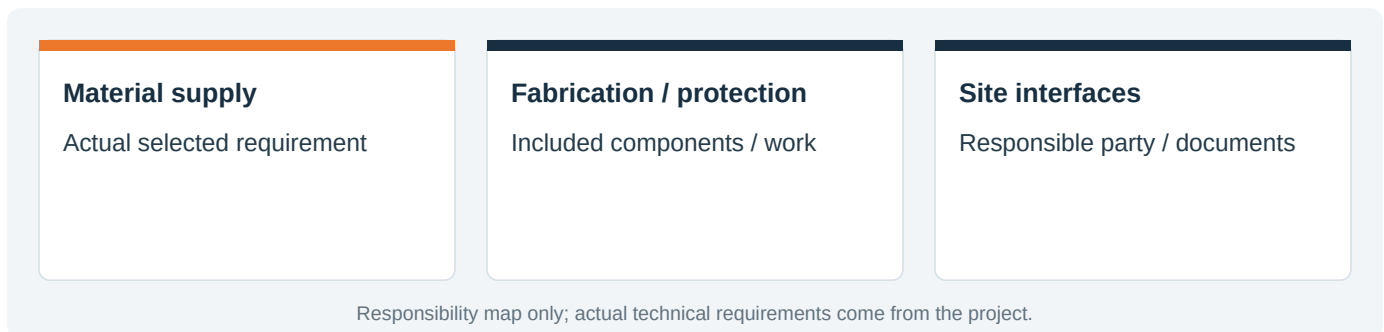
Define supports, connections and site work as interfaces

A pipe package does not silently include every adjacent project operation.

A pipe or spool can meet equipment, supports, expansion arrangements or other project components. Obtain the approved interfaces and identify supplied versus site work. Support and structural requirements come from the responsible project design; the pipe product description alone does not determine them.

For fabricated attachments, use a drawing and material requirements, identify preparation and treatment, and state the required checks. If the package contains only bare pipe, keep support hardware and installation work out of an assumed complete scope. A connected component supplied by another party should have a named reference and decision owner.

The interface cards separate product, fabrication and site responsibilities. They provide no stress, support-spacing or load recommendation. Record the actual boundary so quotation, documentation and receiving quantities describe the same deliverable.



Interface group	State in the package
Equipment / adjacent piping	Mating drawing and selected component references
Attachments / supports	Approved design, included materials and work
Field operations	Responsible party and governing requirements
Records / release	Checks and documents associated with supplied work

Scope language

Identify the operations and components explicitly included. An adjacent requirement is not automatically part of the pipe supplier's order.

07 / INSPECTION AND TRACEABILITY

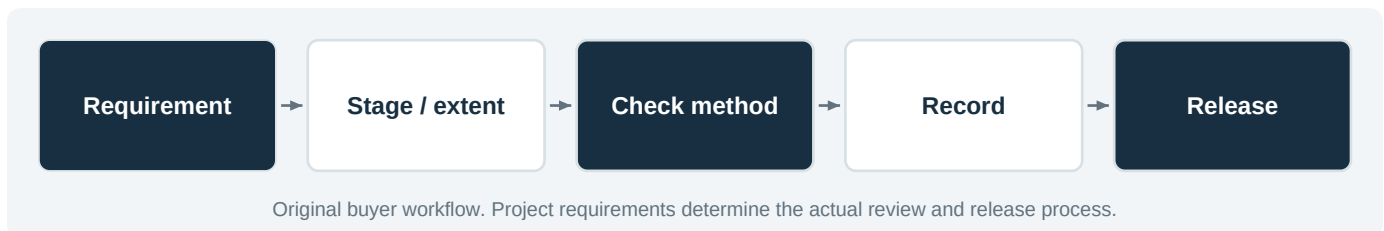
Build an inspection and test plan from purchased requirements

Each check should demonstrate a requirement on an identifiable product.

An inspection and test plan, or ITP, connects product requirements to stages, methods, records and release decisions. Start with the approved specification and drawings. For each check, identify affected items, the governing method and acceptance reference, extent or sampling, required evidence and responsible parties.

Separate checks required by the product specification from project additions and downstream preparation checks. A mixed order can need different plans for pipe, fittings, valves and coating. Do not copy an extensive test list from another service without technical review. Resolve alternative methods or omitted records as explicit deviations.

A hold or witness point has the meaning agreed by the project process. Record notice arrangements, attendance or waiver decisions and release authority. The ITP should show what allows work or shipment to proceed, not merely contain a long list of tests.



Example stage	Requirement to identify	Evidence to agree
Material / identity	Specified product and lot association	Required issued material records
Pipe / preparation	Applicable dimensions and end details	Measurement / inspection records
Protection	Selected system checks and repairs	Treatment and test records
Final review	Document completeness and release conditions	Indexed dossier and release status

The test-list question

What purchased requirement does this check demonstrate, and how does its record identify the affected products?

07 / INSPECTION AND TRACEABILITY

Agree dimensional methods and critical features

A result is only interpretable against its method and acceptance reference.

Identify the features important to the product and assembly: OD, wall, length, ovality or straightness where required, prepared ends, flange interfaces and fabricated dimensions. Use the applicable product or drawing requirements. Additional critical limits should be explicit and confirmed by the supplier rather than hidden in a general statement of exact dimensions.

Record where and how the feature is measured, whether coating is excluded from metal geometry, and the agreed extent. A disputed measurement can involve surface condition, location or method as well as the number itself. The inspection record should let the responsible reviewer reproduce the basis of the decision.

The teaching template below records the structure of a check without inventing an acceptance limit. Populate it with the actual approved requirement and applicable method. Keep original results and disposition records; an unexplained change to a reported value does not resolve a mismatch.

Feature	Required record	Acceptance reference
OD / ovality	Location, instrument, method and result	Applicable product / project requirement
Wall	Measurement basis and affected position	Ordered nominal / minimum basis and limits
Length	Finished state, item reference and result	Order / cut schedule
End geometry	Prepared detail and check method	Approved end requirement
Fabricated interface	Drawing revision and critical feature	Released component / assembly drawing

Quality question

Which requirement makes this observed result acceptable or unacceptable? Keep that answer with the recorded result.

07 / INSPECTION AND TRACEABILITY

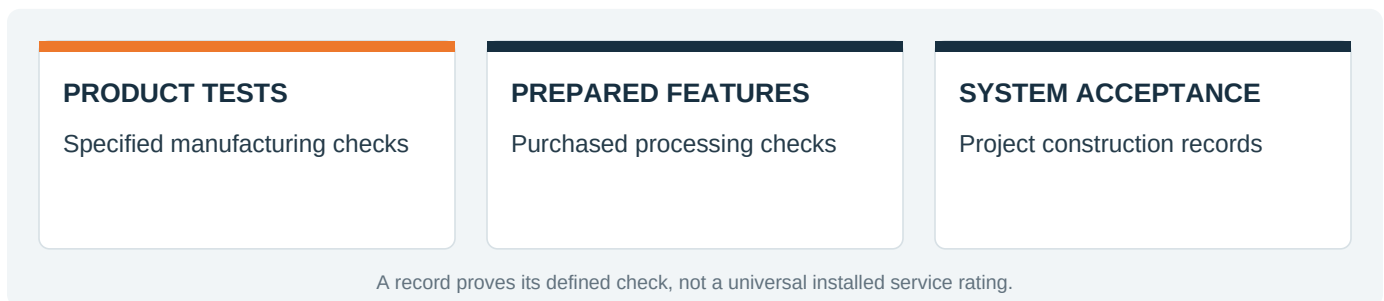
Keep product tests and system acceptance distinct

A mill-test record does not establish the installed service rating.

The product specification and project supplements establish required pipe examinations and tests, their permitted alternatives and their records. Manufacturing tests, preparation checks and installed-system acceptance can have different objectives and responsible parties. Do not treat one test pressure or examination report as a universal service capability.

Ask the supplier to identify the actual applicable checks and what their records cover: pipe body, seam, lot, component or prepared assembly as required. Record the method, extent, identity and acceptance basis. Engineering establishes the system design and acceptance requirements. Procurement preserves those requirements and the evidence needed for the purchased scope.

A generic phrase fully tested leaves the review unresolved. The order needs named records and their scope. If a check is proposed as an alternative to the requested one, identify the governing permission or project decision and retain the accepted result with the ITP.



Evidence layer	What to keep separate
Product manufacture	Specified material and product-test records
Prepared components	Purchased fabrication / treatment checks
Installed system	Project-defined construction and acceptance records

No rating inferred

A test result is evidence for its defined check. Service capability follows the applicable design, product and installation requirements.

07 / INSPECTION AND TRACEABILITY

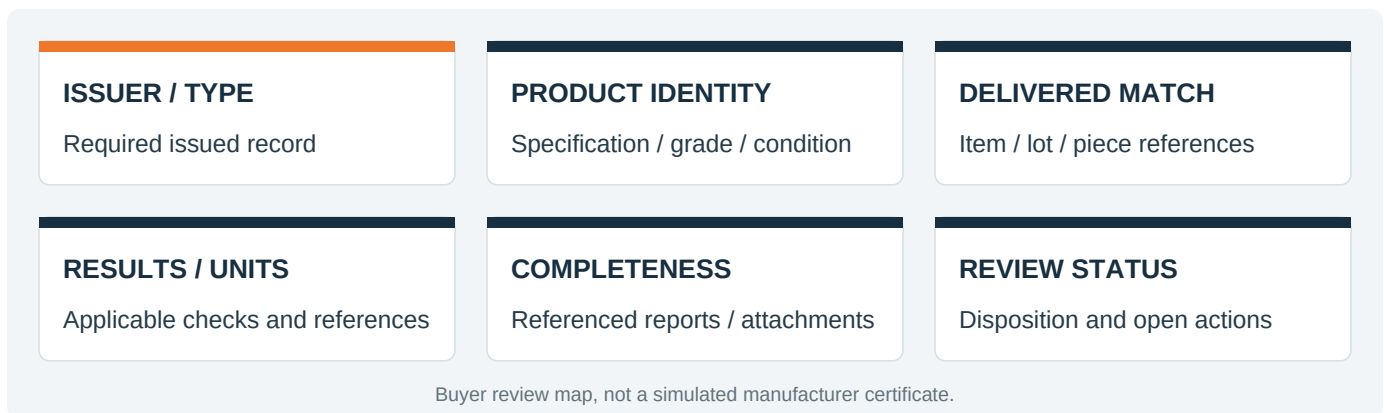
Review material documents before reading individual values

Confirm the issuer, product identity and documentary coverage first.

Begin with the required document type, issuing party, specification, grade, delivered condition and product identifiers. Then compare dimensions and reported checks against the ordered requirements. A document can contain plausible numbers while referring to a different item or lot. The first question is whether it covers the product being delivered.

Check units, methods or referenced reports, issue information and required endorsements through the actual project process. Distinguish reported results from a statement of specification requirements. If a document has a different edition or description, ask for a controlled explanation and supporting evidence instead of rewriting it to resemble the purchase order.

The document diagram is a buyer review map, not a simulated certificate. It intentionally contains no fabricated manufacturer signature or official mark. Use genuine issued records in an actual dossier and preserve the original files with any clarification and final disposition.



Document-review order

Issuer and type -> product identity -> delivered-item match -> required results and references -> completeness -> review decision.

07 / INSPECTION AND TRACEABILITY

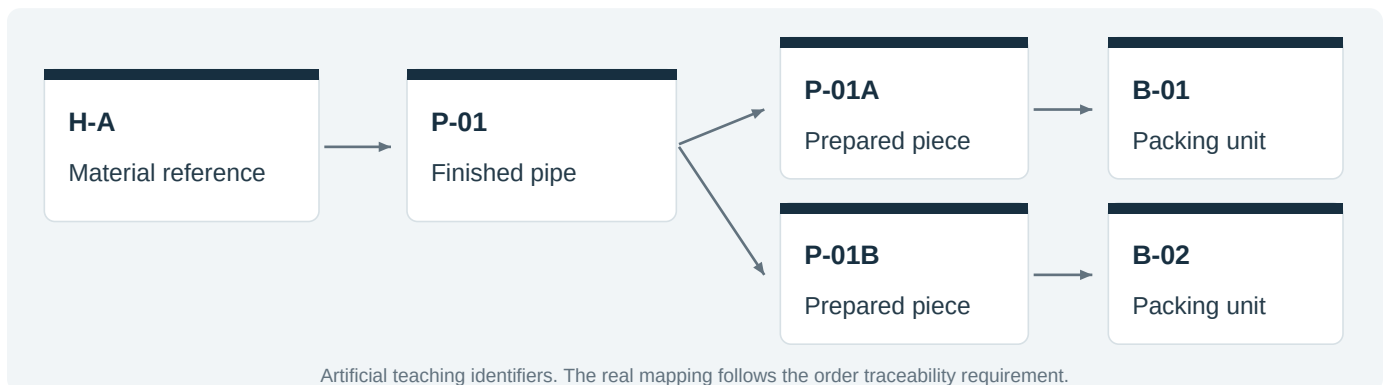
Preserve identity when pieces are split or treated

A heat, production batch, piece and packing unit can use different identifiers.

The order should define the required traceability. Ask how source material records relate to finished pipe and how cutting, preparation or coating preserves that relationship. If new piece numbers are created, record their mapping to the original material and relevant inspections. One number should not be assumed to describe every stage.

The teaching map uses artificial labels to explain a split. Material reference H-A relates to pipe P-01; cutting creates P-01A and P-01B, which enter separately identified packing units. Those labels are not real heat numbers or shipment records. A real map should cover the actual products and required level of identity.

For mixed lots or fabricated assemblies, make the documentary links understandable at receipt. Compare markings, packing records and material documents together. If identification has been lost, request a supported reconciliation through the agreed process rather than a generic assurance of compliance.



Teaching identifier	Relationship being explained
H-A	Source material reference
P-01	Finished pipe associated with H-A
P-01A / P-01B	Prepared pieces mapped to the original pipe
B-01 / B-02	Packing references linked to the prepared pieces

Before processing

Agree how identity is transferred or restored before markings are removed by cutting or treatment.

07 / INSPECTION AND TRACEABILITY

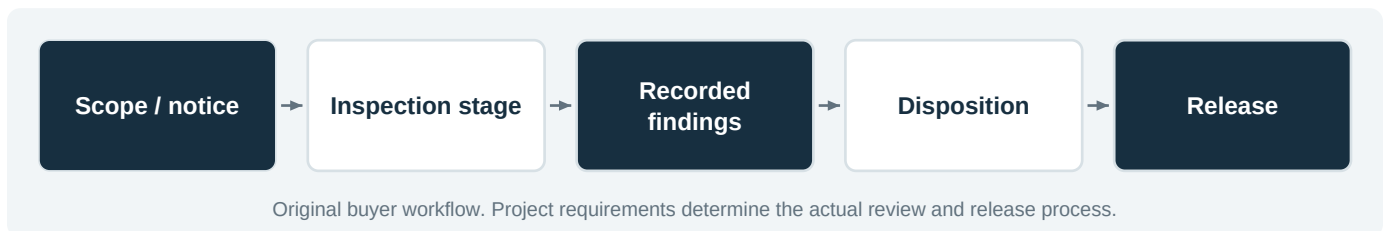
Plan third-party involvement and release records

Inspection participation needs defined scope and authority.

If a project requires third-party inspection, define the scope, affected items, stages, access, notification and records. Clarify who reviews documents and who authorizes release. Attendance at one stage does not necessarily establish acceptance of all product requirements or the complete order.

Use the ITP to record witness or hold arrangements and the process for attendance, waiver, comments and release. State the required report format and its link to product identity. The supplier and buyer should understand how unresolved issues affect further work or dispatch. Changes to the inspection scope should be agreed before the relevant stage passes.

Keep product certification, management-system registration, inspection attendance and purchaser acceptance distinct. Each demonstrates a defined scope. The final dossier should show actual records and dispositions rather than rely on a broad statement that a third party checked everything.



Participation field	Agree before manufacture
Affected products	Items, lots and stages
Required access	Documents, process or finished-product checks
Decision process	Reviewer, notice, waiver and release responsibility
Evidence	Report, open points, dispositions and final status

Release clarity

Record the actual decision and remaining conditions. A visit or collected report is not automatically a shipment release.

08 / RFQ AND OFFER REVIEW

Issue a complete pipe-item schedule

One line should preserve identity, geometry, scope and evidence.

A quoteable line uses a stable buyer reference, standard and edition, grade, PSL where applicable, delivery condition, required route, dimensional basis, length arrangement, ends, protection, quantity and documents. Separate lines when those requirements differ. Preserve line-class, drawing and service references as applicable.

Use controlled attachments for detailed end, coating and inspection requirements. Ask the supplier to keep buyer item references and state the actual offered product. Preliminary values remain visible questions, not silent supplier choices. The accepted order should resolve the requested versus offered description and included records.

The teaching field structure below is not a quotation or current stock promise. In a real RFQ, enter project-approved requirements and revisions. Reconcile totals and remove superseded files before sending the package.

RFQ field	What to enter
Identity	Standard / edition / grade / PSL / condition / required route
Geometry	NPS or direct OD / wall basis / controlling units
Quantity	Count and length arrangement; total / mass basis
Prepared condition	End details; internal / external protection
Evidence	Product / material / inspection records and identity requirements
References	Class, drawing, protection and ITP revisions
Delivery	Packing, destination and supply boundary

Supplier response request

Quote by buyer item number. Identify the offered product, included scope and all assumptions or proposed differences explicitly.

08 / RFQ AND OFFER REVIEW

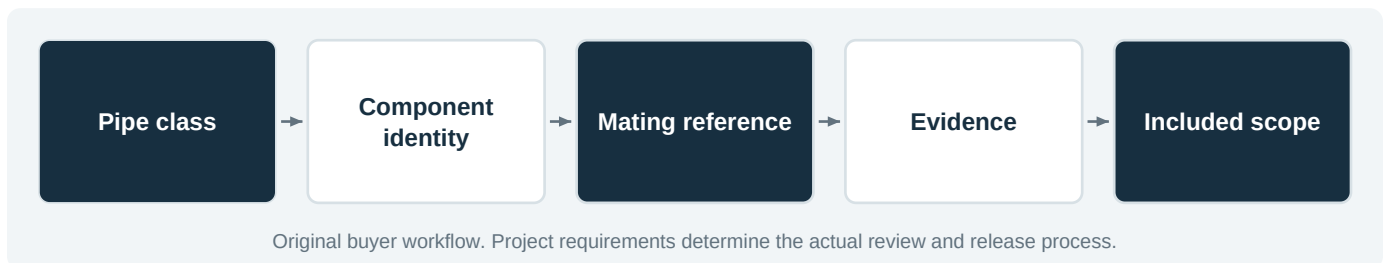
Quote the connected components by their own identities

Do not let a pipe line absorb unspecified fittings, flanges and valves.

Prepare separate component lines or a defined package BOM for fittings, flanges, valves, gaskets, hardware and equipment transitions. Retain the line-class and mating references. A common nominal size does not complete the description of a reducer, flange facing or valve configuration.

List set contents and accessory quantities. Identify whether preparation or assembly is included, and which records follow the completed package. Use the interface worksheet when components come from different parties. The buyer should be able to trace each supplied object to an accepted item or defined included set.

If a supplier proposes a package alternative, ask for a line-by-line comparison of the actual components. Review material, dimensions, ratings basis, selected options, evidence and connected-product consequences. Keep accepted differences visible in the final order rather than retain an obsolete generic BOM.



Component	Additional fields to keep visible
Butt-weld fitting	Type, end sizes, geometry, material and wall basis
Flange / joint set	Type, facing, bore, material, gasket and bolting
Valve	Function, configured product, ends and operator / accessories
Equipment transition	Nozzle drawing and agreed supplied boundary

Package completeness

State what each set contains and how its quantity is reported. Match the drawing or BOM revision used by every party.

08 / RFQ AND OFFER REVIEW

Compare offers on the same accepted basis

Technical differences come before converted unit prices.

First identify conformity or accepted deviations. Then normalize the physical quantity, length arrangement, preparation, component scope, coating, inspection, documents, packing and commercial boundary. Keep supplier figures alongside calculations so another reviewer can reproduce the evaluation without reopening the entire email history.

A bare-pipe price may exclude ends, treatment, supplementary checks or required records. A component package may omit gaskets or hardware. Make missing scope visible, request confirmation and record its evaluation status. Price per tonne, metre or piece must use an agreed comparison quantity; do not hide different physical products inside a conversion.

Timing also needs a start trigger and promised milestone. Confirm the effect of approvals, drawings, documentation review and changes. Actual commercial, freight and import inputs belong in the project offer and evaluation. This publication does not invent prices or delivery guarantees.

Comparison group	Normalize / verify
Product / evidence	Actual identity, condition and required records
Physical quantity	Pieces, lengths, sets and defined mass basis
Preparation / protection	Same included operations and interfaces
Inspection / dossier	Same extent, review stages and issued records
Packing / delivery	Same destination and supply boundary
Timing / terms	Same start conditions and defined milestones

Evaluation recommendation

State the accepted scope, commercial comparison assumptions, remaining questions and any conditions of release.

08 / RFQ AND OFFER REVIEW

Record technical deviations as specific differences

Compare the request, offer, evidence and consequences on one row.

A proposed deviation can involve edition, grade, PSL, route, wall, length, end geometry, component identity, treatment or records. State the requested and offered values, reason and affected items. A general phrase equivalent quality does not identify the decision the reviewer needs to make.

Ask for supporting product information and identify service, fit, inspection, documentary and delivery consequences. The responsible technical reviewer decides whether the proposal is acceptable and under which conditions. Procurement records any commercial agreement separately. The accepted result must update the controlled order documents.

The teaching register illustrates useful question types, not approved substitutions. In a real order, record actual identities and decisions. An approval for one item or application should not silently apply to other dimensions, configurations or later purchases.

Teaching proposal	Review question	Required update
Different PSL / grade	Does the offered product meet the service basis?	Identity and evidence requirements
Different wall / length	What changes in bore, fit, quantities and preparation?	Schedule and interface checks
Different protection	What application and inspection basis supports it?	Treatment and field-work scope
Missing record	Which requirement is left unproven?	Dossier and release conditions

Decision trail

Item reference + requested / offered difference + evidence + approver / date / conditions + affected document revisions.

08 / RFQ AND OFFER REVIEW

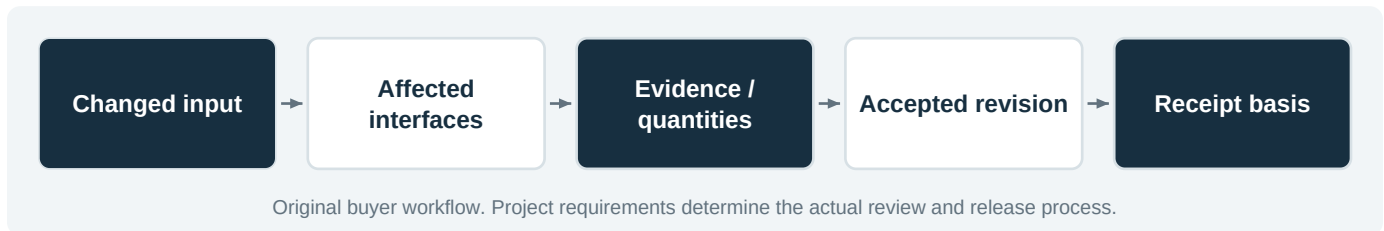
Carry a purchase change through the whole package

A geometry revision can affect components, records and quantities.

When the approved wall, length, connection or material changes, identify all affected products and documents. A schedule change may alter bore, mass, component preparation, coating boundaries, inspection or packing. The buyer should not update only a quantity total while leaving contradictory drawings and offer descriptions active.

Confirm work already completed and agree its disposition through the project process. Record the technical decision, commercial effect and supplier acknowledgement. Issue a controlled order revision and update the receiving basis. Retain earlier records as history rather than overwrite them without an explanation.

The change map below shows coordinated tasks, not a design calculation. Use actual approved values and the responsible reviewers. A proposed thicker wall or alternative length is not an automatic upgrade; it is a difference whose consequences must be assessed.



Revision package

New requirement + affected-item list + drawings / records changed + completed-work disposition + technical and commercial acceptance.

09 / DELIVERY AND DOSSIER

Pack around the actual finished product

Supports, surfaces, ends and labels affect what can be received.

Confirm piece lengths, packing-unit arrangement, protection of prepared ends and coatings, and the information on labels. Ask the supplier for confirmed shipment dimensions and weights on the agreed basis. The receiving facility must be able to unload and store the planned configuration through its responsible logistics process.

Keep item and lot identity understandable when several products share a bundle or shipment. The packing list should report counts, lengths, component sets and documentary references needed for reconciliation. A theoretical bare-pipe estimate does not establish gross shipment mass or the appropriate handling equipment.

The picture illustrates protected coated pipe, not a recorded shipment. Actual shipping images should identify the order, items, date and purpose. Resolve missing identity or required records before dispatch while the products remain available for verification.



AI-generated concept illustration; not a factory, inspection or shipment photograph.

WHAT TO CONFIRM

- 1 Prepared-end protection
- 2 Coating contact surfaces
- 3 Item / lot labels
- 4 Confirmed shipment records

Before dispatch

Reconcile the packing plan, product identity, physical quantities and required dossier against the latest accepted order.

09 / DELIVERY AND DOSSIER

Receive material against the current order

Record the observation before the acceptance decision.

Provide the receiving team with the accepted item schedule, current drawings, packing list, document index and inspection requirements. Check physical quantities, identity, ends, treatment and visible condition. Perform the required dimensional checks using the agreed methods and extent. Do not create a new universal tolerance at the unloading area.

For an issue, identify affected items or packing units, quantity, governing requirement, observation and supporting evidence. Record measurements with method and location. Route the decision to the responsible reviewer and keep the disposition. Document gaps can affect use even where the physical material appears correct.

Preserve identification through storage and distribution according to the agreed traceability requirement. Track partial shipments and open records until they are closed. A structured receiving report makes a supplier response more useful than a general message that some pipe looks different.



Receiving group	Record
Physical quantities	Pieces, lengths, sets and shipment balance
Identity / documents	Product markings mapped to issued records
Prepared features	Measurements, references and observed condition
Issue / closure	Affected items, evidence, review and agreed action

Supplier query

Order + item + requirement + observation + evidence + requested clarification. Retain the agreed response with the receiving file.

09 / DELIVERY AND DOSSIER

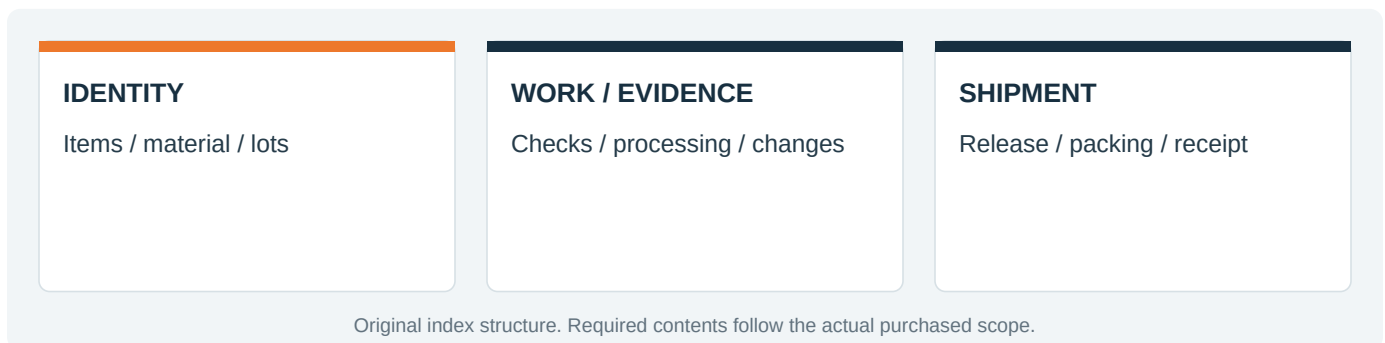
Assemble a manufacturer data record that can be followed

An index should lead from each item to its actual evidence.

The manufacturer data record, or delivery dossier, should reflect the documents actually required for the purchased scope. Index the item schedule, material records, inspections, processing or coating records, deviations, release information and packing references. A large folder is not necessarily a complete or coherent package.

Show document number, revision, issuer where relevant, affected items or lots, and review status. Preserve original issued records and controlled clarifications. A file covering several products should make its scope understandable. Keep missing documents as tracked actions rather than remove them from the index to make the package appear closed.

The original dossier diagram is a navigation example. It does not simulate a certificate or endorse an offered manufacturer. In a real order, the accepted requirement and actual issued records establish which documents belong in the final package.



Dossier group	Typical relationship to preserve
Identity / material	Ordered items to product and lot records
Processing / checks	Prepared features and required reports
Changes / releases	Accepted deviations and remaining conditions
Packing / receipt	Shipment identity and final reconciliation

Closure test

Can a reviewer start with one delivered item and locate its required material, processing, inspection and release records?

10 / TEACHING CASES

Case 1: a dimension-based line-pipe enquiry

Teaching example - preserve all supplied engineering inputs.

For this exercise, a project reviewer supplies an illustrative line-pipe requirement: API 5L, project-approved edition, X52, PSL 2, specified delivery condition and permitted route, direct OD 323.9 mm and nominal wall 9.50 mm. The teaching batch is 80 pieces at 12.000 m. These are scenario inputs, not a recommended design or a claim of current METDAX availability.

Procurement records the required ends, external protection, coating cutbacks and inspection documents from the fictional controlled specifications. Each reference has a revision and decision owner. The enquiry asks the supplier to identify the actual offered combination and any differences, including route, condition, length arrangement and records.

A separate evidence row is used for required licensing or marking where the project asks for it. Material-test and inspection records remain separate from the facility-license check. The enquiry is complete enough to review without inferring service capability from X52, PSL 2 or a pipe image.

Teaching field	Scenario input
Product	API 5L / approved edition / X52 / PSL 2
Condition / route	Specified by the exercise's project requirement
Geometry	Direct OD 323.9 mm / wall 9.50 mm
Quantity	80 pieces x 12.000 m = 960.000 m
Preparation / evidence	Controlled end, protection and inspection references

Case boundary

The scenario teaches an order structure. It establishes no pressure rating, actual project outcome or manufacturer qualification.

10 / TEACHING CASES

Case 1: quantities, split lots and delivery records

Teaching example - keep theoretical mass separate from confirmed shipment data.

Using the earlier ideal-geometry calculation, the teaching pipe has about 73.66 kg/m of bare steel. One 12.000 m piece is about 883.91 kg; 80 pieces total about 70,712.62 kg. These numbers use the stated density assumption and exclude coating, end changes and packing. They are planning outputs, not a weighing certificate.

The exercise splits delivery into 60 pieces and 20 pieces: 720.000 m and 240.000 m, which reconcile to 960.000 m. Each shipment retains buyer item references, lot mappings, required records and a balance report. The supplier confirms actual shipment information before transport decisions are made.

If an offer changes the physical length or preparation, procurement recalculates quantities and identifies affected interface or protection documents. The reviewer assesses technical differences; procurement records commercial agreement. Receiving reconciles the accepted piece arrangement and evidence, not only a mass total.

LOT A: 60 PIECES

720.000 m

LOT B: 20 PIECES

240.000 m

Teaching delivery split: 80 pieces / 960.000 m total.

Teaching shipment	Pieces	Ordered length
Lot A	60	720.000 m
Lot B	20	240.000 m
Total	80	960.000 m

Case lesson

A correct mass estimate does not replace piece counts, exact lengths, identity or required shipment records.

10 / TEACHING CASES

Case 2: turn a refinery line class into item lines

Teaching example - avoid reducing a component package to one pipe grade.

The exercise begins with a released refinery line list and fictional material class MC-01, revision C. Its approved component requirements identify pipe, elbows, flanges, joint materials and a configured valve. The class identifier is invented for the example and has no universal meaning. The buyer obtains the actual class sheet rather than guessing its contents.

The teaching schedule has 24 pipe pieces at 6.000 m, ten elbows, four flange connections and one valve. The component requirements come from the exercise's approved documents; this guide does not select their service ratings. Procurement separates pipe identity, fitting geometry, flange configuration and valve materials or options into individual lines.

The supplier response preserves those references and names the actual offered components and evidence. Any changed material, end or option enters the deviation register. The buyer also identifies whether gaskets, bolting, preparation and records are included in each connection set, so the price and delivery quantities describe a complete agreed scope.

Teaching item	Quantity	Controlled identity source
R-P01 / pipe	24 x 6.000 m = 144.000 m	MC-01 C / pipe requirement
R-F01 / elbows	10 pieces	MC-01 C / fitting requirement
R-J01 / flange connections	4 defined connection sets	Interface and class documents
R-V01 / valve	1 configured item	MC-01 C / valve requirement

Case lesson

The material class coordinates several product identities. A pipe grade or nominal size does not specify the complete package.

10 / TEACHING CASES

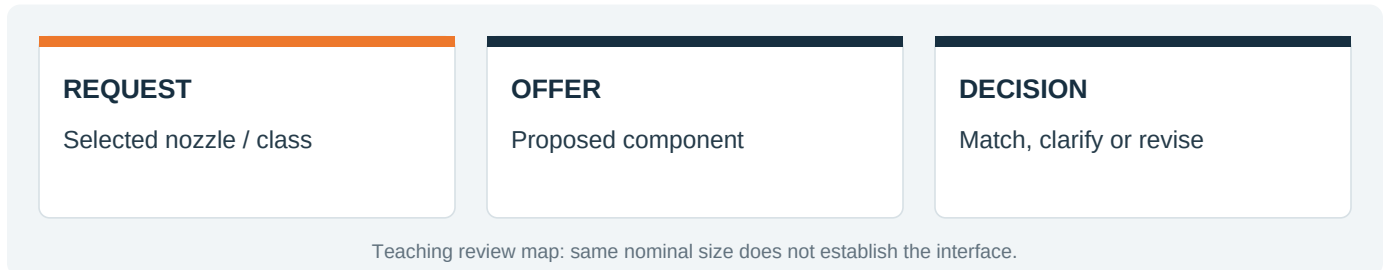
Case 2: resolve an equipment-nozzle mismatch

Teaching example - review the connected interface before fabrication.

During offer review, the coordinator finds that the proposed flange reference does not match the selected equipment-nozzle drawing. The nominal size is the same, but the facing or dimensional-series reference is different. The buyer records the requested and offered identities and asks the responsible engineer to resolve the interface.

The review examines the actual mating requirements, pipe-wall or bore arrangement, joint materials, hardware and evidence. Procurement does not assume a higher class is a universal replacement. The accepted decision, any changed components and commercial effect are recorded with the updated class or interface documents.

The exercise does not claim that a specific alternative was approved. It shows the questions that a reviewable resolution answers. A real supplier then confirms the accepted product and preparation. The receiving checklist uses that same interface revision and required records rather than the initial conflicting offer.



Mismatch question	Document the answer
What differs?	Exact requested and offered flange / nozzle references
What connects?	Facing, series, bore, joint materials and hardware
Who decides?	Technical reviewer, conditions and date
What changes?	Component schedule, drawings, records and order revision

Case lesson

Physical fit, rating basis and assembled scope require coordinated review. Same nominal size is not sufficient evidence of compatibility.

10 / TEACHING CASES

Case 3: an MRO replacement with a length ambiguity

Teaching example - preserve the existing approved material record.

A maintenance request asks for twenty-foot replacement pipe in a familiar size. The buyer obtains the current material class, original product record and replacement details before preparing the enquiry. The teaching quantity is 100 pieces; the exact approved product identity and ends are retained instead of selected from the informal message.

One supplier quotes 20 ft pieces, while another proposes 6.000 m pieces. At the exact international-foot conversion, the requested arrangement is $100 \times 6.096 \text{ m} = 609.600 \text{ m}$. The proposed metric arrangement is 600.000 m total. The 9.600 m difference is distributed across every piece, not a single missing length.

Procurement checks the fabrication and replacement implications with the responsible team. If the alternative is accepted, the final order states it explicitly and updates the quantity basis. The supplier records are checked against the accepted product identity, and receipt reconciles piece length and count together.

100 x 20 ft

609.600 m total

100 x 6.000 m

600.000 m total

Teaching difference: 0.096 m per piece / 9.600 m total.

Teaching offer	Piece length	Total for 100 pieces
Requested / Offer A	20 ft = 6.096 m	609.600 m
Proposed / Offer B	6.000 m	600.000 m
Difference	0.096 m per piece	9.600 m total

Case lesson

A nearly equal trade length can still be a changed physical requirement. Evaluate the actual pieces before comparing converted prices.

Source scope: G11 | Reference register: page 59

10 / TEACHING CASES

Case 3: preserve evidence during an urgent purchase

Teaching example - define what is accepted, pending and required at receipt.

An urgent maintenance order can begin with incomplete documentation, but the gaps should remain visible. The buyer identifies the records required by the approved material and project process, asks the supplier for an indexed response and records which items or documents are still unresolved. Urgency does not define a substitute material or authorize an unexplained document mismatch.

The responsible reviewer can assess the supplied evidence and determine the applicable release conditions. Procurement records that decision, the accepted offer, quantity arrangement and required follow-up actions. If the supplier proposes a different specification or condition, the proposal receives an item-specific technical review rather than a generic emergency exception.

At receipt, the team checks the current order, identification, required features and actual records. Open issues are tracked to closure and product identity is preserved during distribution. The teaching case claims no guaranteed lead time, savings or acceptance outcome; it demonstrates a controlled purchase and evidence trail.

Urgent-order record	Keep explicit
Accepted product / quantity	Latest technical identity and physical arrangement
Evidence received	Actual documents and affected items
Open actions	Missing information, owner and expected response
Release decision	Responsible reviewer and conditions
Receipt / closure	Observations, dispositions and final records

Case lesson

Use clear status and responsibilities. Do not make an incomplete dossier appear complete by omitting the unresolved requirements.

11 / FILLABLE WORKSHEETS

Worksheet A: project and line-list inputs

Prepare the purchasing context and identify open technical decisions.

Record the application, governing segment, line or class references and current revisions. Preserve the engineer-defined conditions and selected materials basis. Attach the released documents through a controlled register rather than duplicate conflicting values across files.

Identify the responsible reviewers and unresolved questions. This page supports an RFQ and requirements discussion; it does not select a pipe wall, material or rating. Mark preliminary inputs and carry approved requirements into the item schedule before final release.

Project / enquiry reference

Company / contact

Application / line segment

Line / material-class reference

Governing code / edition / revision

Design / service-input reference

Controlling units / quantity basis

Special-service reviewer

Supplier / site scope boundary

Destination / required milestone

Current attachments and document revisions

Preliminary inputs, open questions and owners

Before issuing the enquiry

Confirm the governing requirement set, physical scope, current attachments and owners of any remaining technical inputs.

11 / FILLABLE WORKSHEETS

Worksheet B: one complete pipe item

Use a separate buyer reference for each distinct product requirement.

Enter the exact standard and edition, grade, PSL where applicable, condition and route. State the controlling size and wall basis, physical quantity, length arrangement, prepared ends and protection. Reference detailed requirements by document number and revision.

List required evidence and identification, including any specified licensing or marking requirement. Ask the supplier to preserve this item reference and record its offered product and deviations. Reconcile totals before the accepted description enters the order.

Buyer item / line reference

Product standard and edition

Grade / PSL if applicable

Delivery condition / required route

NPS or direct OD / wall basis

Controlling dimensions and units

Pieces / lengths / total / mass basis

Prepared ends and detail reference

Internal / external protection

Required product / inspection records

Attachment revisions, identity and packing requirements

Offered product, assumptions and proposed deviations

Item completeness

The schedule should let a supplier quote the defined scope and a receiving team recognize the accepted product without interpreting informal messages.

11 / FILLABLE WORKSHEETS

Worksheet C: component and mating interfaces

Connect the offered part to its actual pipe, fitting or equipment reference.

Complete the configured component identity and source requirements. Record the mating item or nozzle drawing, dimensional series, facing or end geometry, materials, joint components and included accessories as applicable. Use actual project and selected-manufacturer information.

Identify the party supplying and checking each connected part. Record unresolved fit, rating-basis or documentary questions. An image or nominal size alone does not establish the interface. Carry the agreed answer into the component schedule and receiving checks.

Buyer item / component type

Offered model / material identity

Governing class / drawing revision

Size / dimensional series / wall

Rating basis / design reference

Facing / ends / mating geometry

Mating item / equipment nozzle

Gasket / bolting / accessories

Supplying / checking parties

Reviewer / decision reference

Actual interface requirements and supporting documents

Unresolved differences and accepted conditions

Release condition

Use the accepted mating references and configuration. Revisit the interface record if the material, geometry, operator or equipment drawing changes.

11 / FILLABLE WORKSHEETS

Worksheet D: inspection and document requirements

Define a check or record against a purchased requirement.

Record the affected product, requirement reference, inspection stage, method and extent. Identify required reports, product association, participants and review or release responsibilities. Separate standard-required checks from project additions through the actual governing basis.

Use one page per check or documentary requirement where detail is needed. A general test name or fully tested statement cannot show compliance by itself. Keep observed results, referenced evidence and dispositions with the controlled ITP and dossier.

Item / lot / prepared-piece reference

Requirement and revision

Inspection / processing stage

Applicable method / procedure

Extent / sampling reference

Acceptance criterion reference

Participants / notice / release owner

Required report / document type

Issued report / evidence reference

Review status / disposition

Identity mapping, reported observations and relevant results

Hold / witness conditions, open actions and closure

A reviewable check

Requirement + product identity + method / stage / extent + issued record + responsible review and release status.

11 / FILLABLE WORKSHEETS

Worksheet E: technical deviation and change record

Show the requested and offered difference with its evidence and consequences.

Name affected item numbers and revisions. Record the proposed change, reason, service or interface consequences and supporting documents. Route the technical decision to the authorized reviewer and record conditions. Keep commercial agreement visible where it is also required.

After acceptance, identify revised schedules, drawings, inspection records and receiving requirements. Confirm work already completed and supplier acknowledgement. This worksheet records a decision process; it does not establish equivalence or grant approval on its own.

Affected buyer items / revision

Supplier / proposal reference

Requested requirement

Offered product / requirement

Reason for proposed difference

Supporting documents / revisions

Technical reviewer / date

Decision / conditions reference

Commercial agreement / impact

Supplier acknowledgement / date

Service, interface, quantity and evidence consequences

Completed-work disposition and controlled document updates

Close the change

Carry the accepted configuration into manufacture, packing and receipt. Retain the original proposal and responsible decision with the revision history.

11 / FILLABLE WORKSHEETS

Worksheet F: shipment and receiving reconciliation

Connect the delivered physical product to the current order and evidence.

Use the accepted item schedule, current drawings, packing list and document index. Reconcile quantities, product identity, prepared features, treatment and required records. For split shipments, record the received and remaining balances on their agreed physical basis.

For an issue, identify the affected quantity, requirement, observation and supporting photographs or measurements. Record the responsible disposition and closure. Preserve identification through handling and distribution according to the agreed traceability requirement.

Order / shipment / lot reference

Buyer item / piece / packing unit

Received count / lengths / sets

Remaining shipment balance

Identification / record match

Ends / treatment / visible condition

Required measurement / method

Documents received / missing

Reviewer / date

Disposition / closure reference

Observed issue, affected quantity and supporting evidence

Agreed action, responsible party and final closure

Supplier issue record

Order and item + affected quantity + requirement + observation / evidence + responsible decision and agreed action.

12 / QUICK REFERENCE

Terms and ambiguities to resolve before release

Use shared words without losing their project-specific basis.

A short glossary helps procurement, engineering, suppliers and receiving teams talk about the same object. The meanings below are working explanations for this handbook. Actual obligations and acceptance limits come from the applicable project and order. Keep the defining document close to the field rather than rely on a shorthand label.

For recurring ambiguities, record the exact question, decision owner and accepted answer in a lessons file. Update RFQ templates where useful, but do not turn a project-specific resolution into a universal technical rule. Recheck the basis when service, specification, product or manufacturer changes.

Term / ambiguity	Working explanation / next question
Line list	Project line and service references; which revision governs?
Material class	Coordinated component requirements; obtain the actual class sheet
PSL	Required product level; preserve edition and supplements
Schedule / wall	Geometry designation; identify size and acceptance basis
Flange class	Rating designation within a stated basis, not a universal psi value
ITP	Inspection stages, requirements, evidence and decisions
MDR / dossier	Indexed required records linked to delivered products
Heat / lot / piece	Different identities; verify their documented relationship
Deviation	Specific proposed difference requiring the responsible decision
20 ft / 6 m	Different piece lengths; identify the controlling value
Coated pipe	Which base product, treatment, boundaries and records?

Final check

A reader should be able to trace each accepted requirement from the schedule to its governing document, offered product and delivery record.

13 / REFERENCES AND IMAGE POLICY

Sources, illustrations and calculation method

Public scope references do not replace the governing project requirements.

References were checked on 13 October 2026 using public publisher information. Source editions identify the reviewed pages, not the edition required by every order. Scope summaries and limited dimensional examples are used; complete proprietary standards and acceptance tables are not reproduced. Ideal bare-pipe mass uses the explicitly stated density and geometry assumptions.

Product pictures are AI-generated concepts reused from the METDAX asset library. Original diagrams, artificial identifiers and three teaching cases explain procurement, not actual inspected products or completed projects. No image or example establishes manufacturer licensing, product certification, service rating or project approval.

G01 ASME - B31.3: public process-piping scope

G02 ASME - B31.4: public liquids / slurries pipeline scope

G03 ASME - B31.8: public gas-transmission / distribution scope

G04 API - API 5L 47th edition announcement, 2 June 2026

G05 API - Composite List: official facility and program-scope search

G06 ASTM International - A106 / A106M-26: public product scope

G07 ASTM International - A335 / A335M-26: public alloy-pipe scope

G08 ASTM International - A312 / A312M-24: public stainless-pipe scope

G09 ASME - B36.10: wrought-steel pipe dimensional scope

G10 Wheatland Tube - Standard Pipe brochure: four selected OD examples

G11 NIST - International foot: exact 0.3048 m relationship

G12 ASME - B16.25: public butt welding-end scope

G13 ASME - B16 brochure: B16.5 public flange scope

G14 ASME - B16.34: public valve scope

G15 AMPP - Standards resources: MR0175 / ISO 15156 references

Version record

MDX-TP-03 / version 1.0 / 13 October 2026. First illustrated edition. Preserve source, calculation, diagram and worksheet changes in future revisions.

METDAX / NEXT STEP

Send a controlled line-pipe or plant-piping enquiry

Steel pipe, fittings, flanges, valves and related project interfaces.

METDAX Industrial Supply includes line pipe, welded and seamless pipe, connected components and protection-related product families in its website range. Send the actual application, released material schedule, physical quantities, preparation, required records and delivery destination. Identify preliminary information and the questions still requiring engineering review.

Use the project and pipe-item worksheets, and add the interface and ITP pages where needed. Preserve buyer item numbers and attachment revisions. Ask the quotation to state the actual offered products, included scope and deviations line by line. Current availability, configuration, evidence and commercial responsibilities are established in the accepted offer and order.

For a delivered-product question, retain the order and item references and provide relevant records, photographs or measurements. This handbook helps organize the enquiry and evidence. Design and product acceptance remain with their actual governing documents and responsible reviewers.



Defined pipe enquiry



Coordinated interfaces



Protection scope

AI-generated product illustrations. No product approval or inspected-lot evidence is implied.

Contact METDAX

Email: ruofan1901@gmail.com | Handbook reference: MDX-TP-03. Include buyer item numbers, controlled documents and the required delivery scope.

Send your material schedule to METDAX