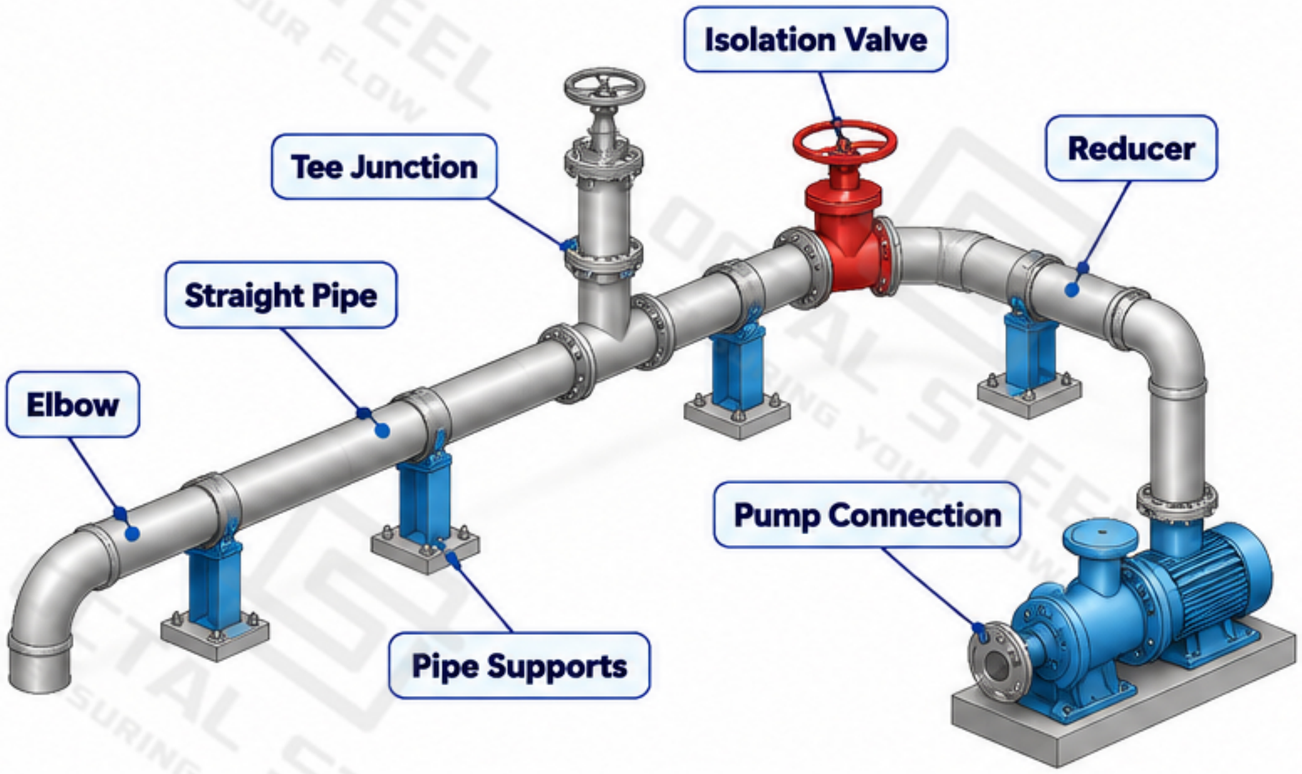
Installation Planning and System Preparation

Preparing the Pipeline System for Safe and Reliable Installation

Pipeline Installation Preparation



Pre-Installation Check

Pre-Installation Check	Key Information
Operating Conditions	Conveyed medium, pressure and temperature
Pipe Specifications	DN, ID, pressure rating and pipe construction
Reinforcement Type	Steel cord, glass fiber or polyester fiber
Connection System	Threaded, flanged or reinforced sleeve connections
Pipeline Layout	Route, bends, elevations and equipment interfaces
Installation Conditions	Lifting equipment, support locations and working space
Inspection Requirements	Pressure testing and acceptance criteria

Installation Preparation Sequence

01 Review Drawings → **02** Inspect Materials → **03** Prepare Route → **04** Confirm Joints → **05** Approve Installation

Engineering Note

All pipe components, fittings and connection arrangements should be checked against the approved project drawings before installation.

Proper preparation helps prevent joint incompatibility, installation stress and unnecessary site modifications.

Pipe Handling, Storage and Route Preparation

Protecting Pipe Integrity Before Installation

Pipe Handling and Storage



Lifting and Handling



Transportation and Storage



Pipe End Protection

A. Lifting and Handling

- Use suitable lifting equipment and wide, non-damaging slings.
- Avoid direct contact between sharp lifting accessories and the pipe surface.
- Do not drag pipes across rough ground.

B. Transportation and Storage

- Place pipes on stable, level supports.
- Prevent rolling, impact and concentrated loading.
- Protect pipe ends from contamination and mechanical damage.

C. Pipe End Protection

- Keep threaded ends and flange faces protected.
- Prevent foreign materials from entering the pipe.
- Inspect the inner and outer surfaces before installation.

Storage and Handling Requirements

Inspection Item	Recommended Practice
Lifting	Use suitable slings and approved lifting points
Pipe Support	Avoid localized loading and excessive unsupported spans
Stacking	Follow manufacturer-approved stacking limits
End Protection	Keep pipe ends clean and protected
Surface Protection	Avoid impact, dragging and sharp contact
Bending	Follow the manufacturer's specified minimum bending radius

Pipeline Route Preparation



- Provide sufficient clearance for pipe placement, joint assembly and future maintenance.
- Avoid unnecessary bends, abrupt diameter changes and poorly arranged transitions.
- Consider support locations, equipment interfaces and access points before positioning the pipes.

Engineering Note

Pipe stacking limits, lifting arrangements and minimum bending radius must be determined from the actual pipe specification and manufacturer instructions. Universal values should not be assumed.

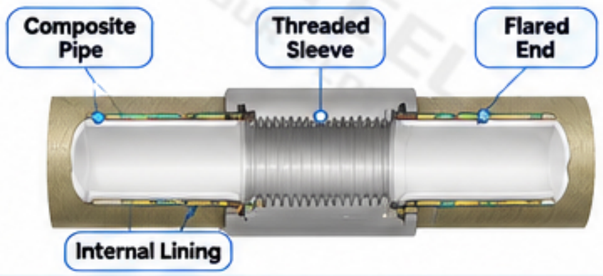
Proper handling and route preparation help protect the outer protective layer, maintain pipe-end quality and reduce installation problems before joint assembly begins.

Pipe Joint Assembly and Connection Installation

Connection Selection, Assembly Procedures and Joint Integrity

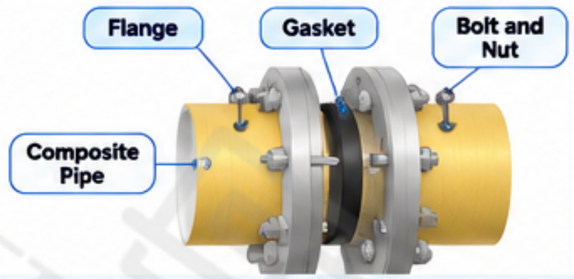
Four Connection Types and Installation Control

1. Crimped and Hot-Flared Threaded Connection



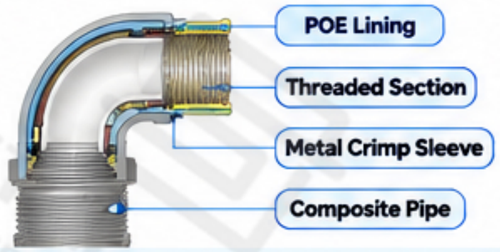
- Check thread compatibility and engagement.
- Confirm sleeve crimping and flared-end condition.
- Inspect sealing components before assembly.

2. Crimped and Hot-Flared Flange Connection



- Align flange faces before tightening.
- Check gasket positioning and compatibility.
- Follow the specified bolt-tightening procedure.

3. Metal Crimped Threaded Joint with POE Lining



- Check internal lining continuity.
- Confirm thread and sealing compatibility.
- Inspect the internal flow-contact surface.

4. Non-Metallic Reinforced Sleeve Connection

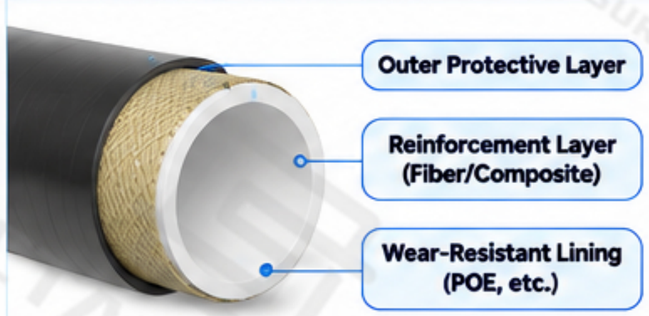


- Check mating surface preparation.
- Follow the specified sleeve joining procedure.
- Inspect the completed joint and sealing area.

Joint Assembly Control Points

Assembly Stage	Key Control Point
1. End Inspection	Check pipe ends and connection components.
2. Component Matching	Verify threads, flanges, sleeves and seals.
3. Alignment	Maintain proper concentricity and alignment.
4. Joint Assembly	Use the specified tools and assembly procedure (e.g., crimping, flaring, bolt-tightening or bonding).
5. Final Inspection	Check joint condition and sealing integrity (e.g., visual, dimension and pressure test as required).

Joint Integrity and Internal Flow Continuity



- Maintain a secure mechanical joint.
- Ensure a smooth and continuous internal flow passage.
- Avoid damage to the wear-resistant lining during assembly.

Key Installation Points

- Select a compatible connection type according to the design and operating conditions.
- Keep pipe ends clean, undamaged and in good condition.
- Ensure accurate alignment and correct tightening or crimping.
- Follow the manufacturer's installation procedure and inspection requirements.

Engineering Note

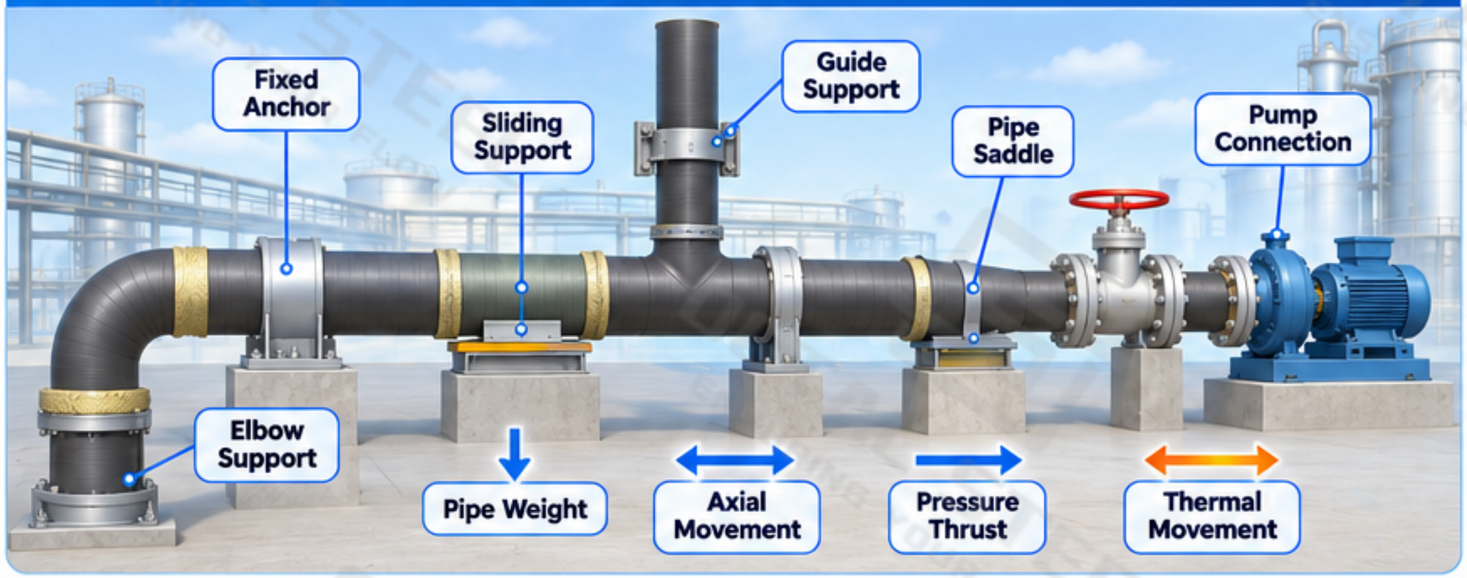
The assembly procedure, sealing arrangement and tightening requirements should follow the specific connection design to ensure long-term joint integrity and reliable slurry transport.

Proper joint assembly ensures mechanical strength, sealing performance and internal lining continuity, which are critical for the safe and durable operation of wear-resistant composite pipelines.

Pipeline Supports, Anchoring and Installation Control

Managing Pipe Loads, Alignment and Movement During Installation

Pipeline Support and Anchoring Arrangement



Support and Anchoring Considerations

Pipeline Location	Engineering Consideration
Straight Pipe Sections	Distribute pipe weight and maintain alignment
Elbows and Tees	Account for directional pressure thrust and local loads
Reducers	Check support and alignment around diameter transitions
Valves and Heavy Fittings	Prevent excessive loads on adjacent pipe sections
Pump Interfaces	Avoid transferring pipe weight and misalignment to equipment nozzles
Anchors and Guides	Control axial movement according to the designed support arrangement

Support arrangements are used to carry the weight of the filled pipeline, maintain alignment, control movement and accommodate loads generated by pressure, temperature change and connected equipment.

Support locations should be selected according to pipe dimensions, reinforcement construction, operating conditions and the actual pipeline layout.

Installation Control Sequence

01 Set Out the Pipeline Route
Confirm centerlines, elevations and support positions.

02 Install Supports and Anchors
Verify support arrangement against approved engineering drawings.

03 Position Pipe Sections
Use suitable lifting equipment and avoid forced bending.

04 Align and Assemble Connections
Ensure proper alignment without imposing unnecessary installation stress.

05 Verify Installation Condition
Check support contact, clearances, joint condition and equipment interfaces.

Engineering Note

Support spacing, anchor locations and allowable external loads must be determined from the actual composite pipe design and project engineering calculations. Values established for conventional steel pipelines should not be transferred directly to composite pipes.

Proper support and anchoring help maintain alignment, control movement and prevent excessive external loads at joints, valves and equipment interfaces.

Pressure Testing, Commissioning and Maintenance

Verifying Pipeline Integrity Before and During Operation

Pressure Testing and Commissioning Process



01 Test Preparation → 02 Filling and Venting → 03 Pressure Testing → 04 Depressurization → 05 Flushing and Cleaning → 06 Initial Start-Up

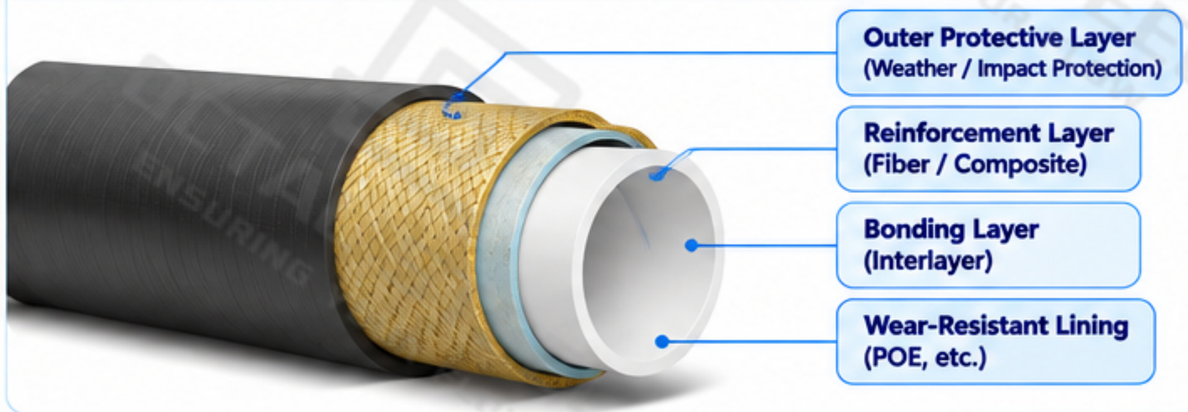
Key Pressure Testing Considerations

Item	Requirement
Assembly Check	Confirm that all joints and fittings are fully assembled before testing.
Pressure Rating	Verify the pressure rating of every component within the test section.
Air Removal	Remove trapped air before pressurization.
Pressurization	Increase pressure gradually according to the approved test procedure.
Leakage Check	Inspect connections and pipe sections for leakage or abnormal movement.
Depressurization	Release test pressure safely after testing.

Pipeline Inspection and Maintenance

Inspection Item	Main Evaluation
Visual Inspection	Leakage, external damage and deformation.
Joint Inspection	Threaded, flanged and sleeve connection condition.
Support Inspection	Support contact, movement and anchoring condition.
Operating Monitoring	Flow rate, pressure drop and abnormal changes.
Wear-Prone Locations	Elbows, tees, reducers and pump interfaces.

Composite Pipe Structure and Inspection Focus



Engineering Takeaway

Proper handling, compatible joint assembly, engineered support arrangements and controlled commissioning are essential to maintaining tine structural integrity of a wear-resistant composite pipeline.

The test pressure, holding time and acceptance criteria must follow the manufacturer's approved procedure and project specifications.