

Sucker Rod Coupling Connection Overview

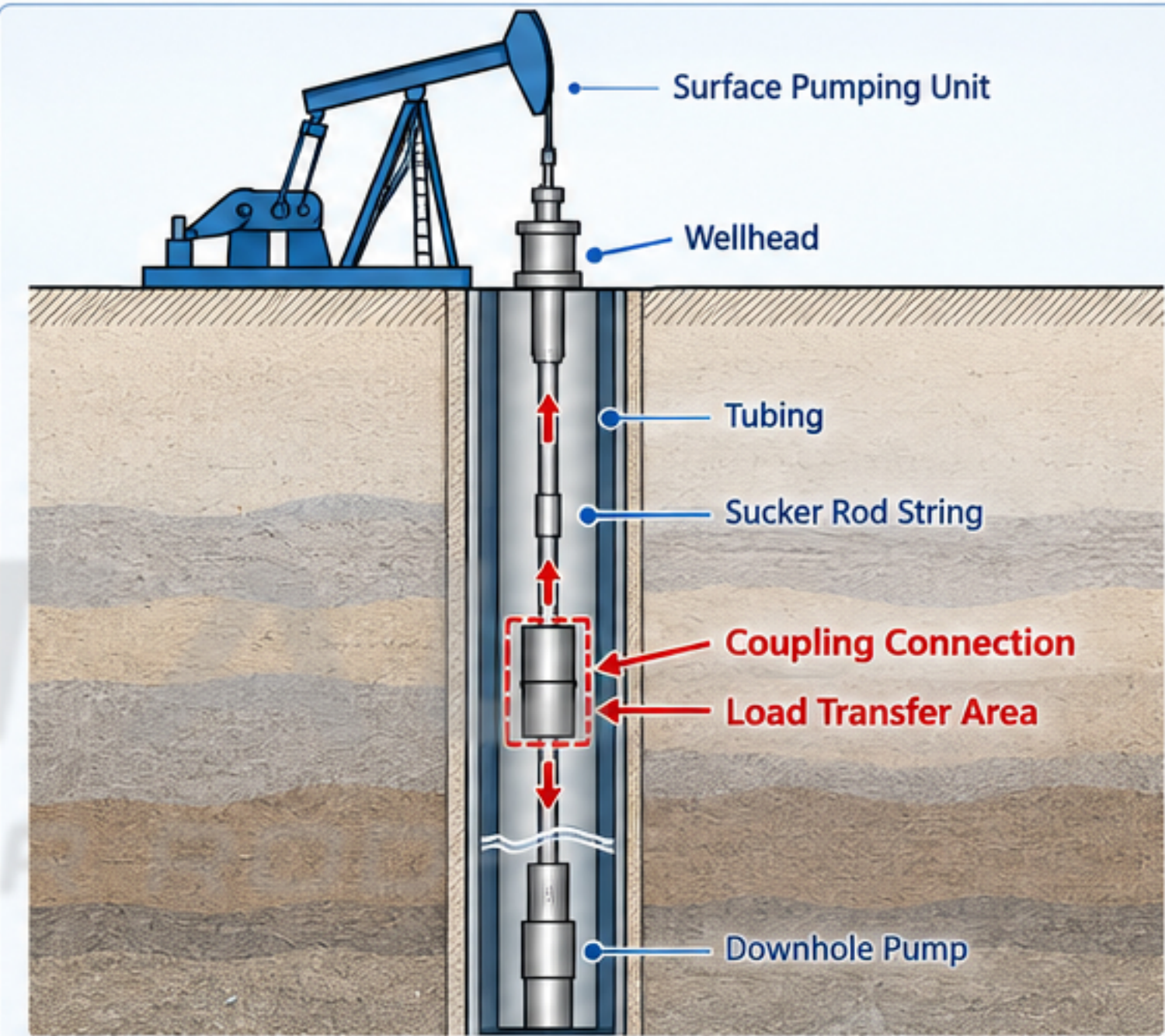
Connection as a Critical Load Transfer Point

Sucker rod couplings transfer tensile load and reciprocating forces between individual rod sections through threaded connections. During repeated pumping cycles, thread engagement, shoulder contact and dimensional accuracy directly influence connection reliability.

Connection failures may result from improper thread matching, insufficient make-up condition, excessive wear, corrosion exposure or manufacturing deviations.

Typical Failure Triggers

- 1 Thread mismatch
- 2 Insufficient make-up
- 3 Wear
- 4 Corrosion
- 5 Dimensional deviation



Main Connection Control Factors

Control Factor	Engineering Influence
Thread Geometry	Determines engagement quality
Make-up Condition	Affects load distribution
Surface Condition	Influences wear and sealing behavior
Dimensional Accuracy	Ensures rod-coupling compatibility

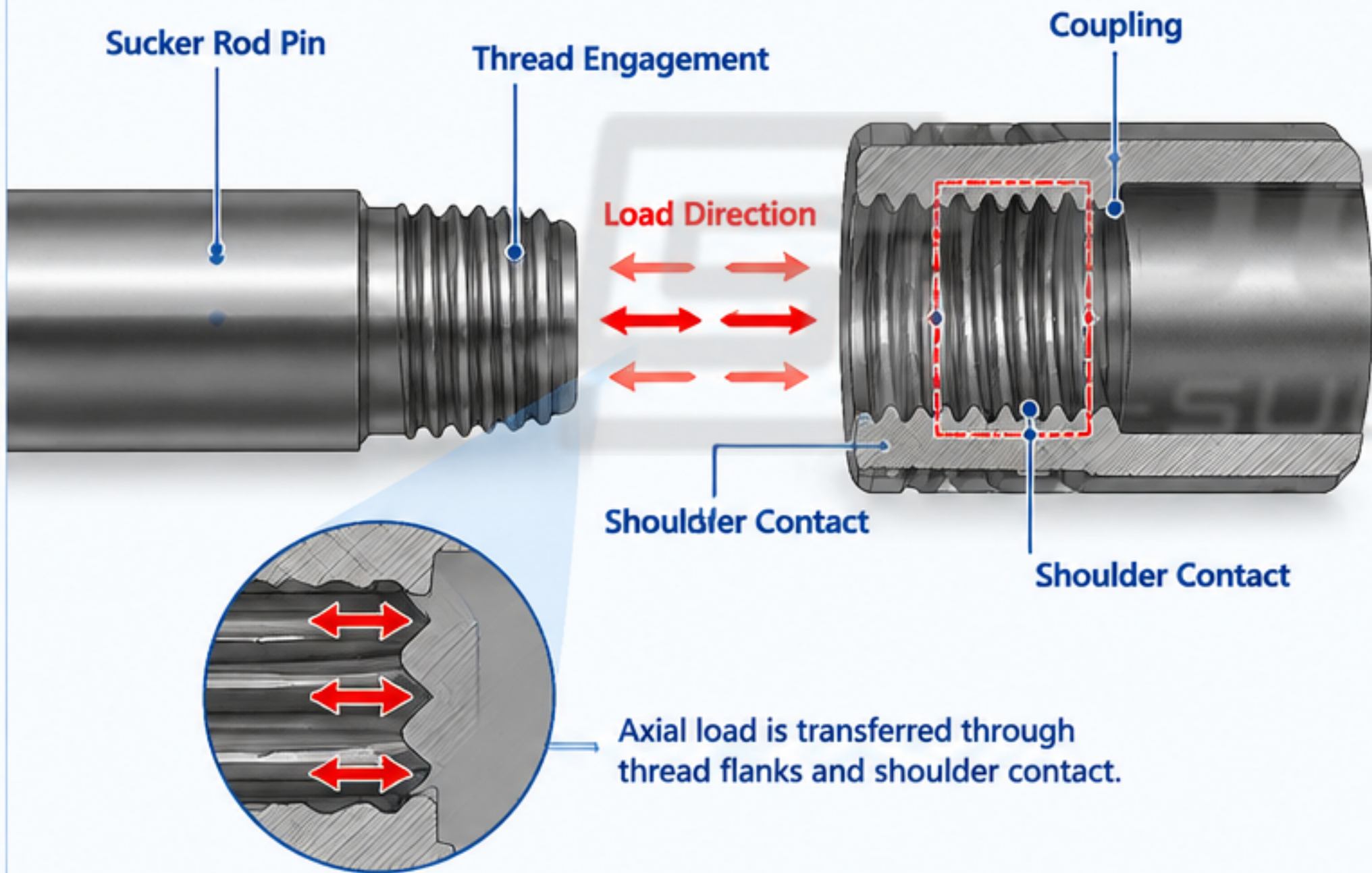


Reliable coupling performance depends on controlled thread engagement, dimensional accuracy and operating condition management.

Thread Design and Load Transfer Control

Thread Connection and Load Transfer

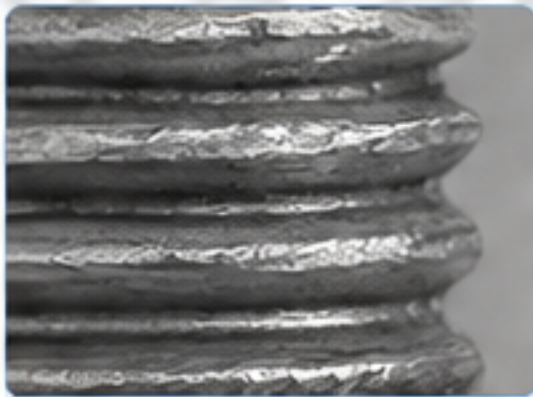
Thread connection quality directly affects how loads are transferred between sucker rods and couplings. Proper thread design and make-up condition help ensure stable load transfer during repeated pumping cycles.



Key Thread Control Parameters

Parameter	Function
Thread profile	Maintains proper engagement and load transfer
Thread pitch	Controls connection matching
Thread angle	Affects thread strength and sealing performance
Thread depth	Determines load carrying area
Shoulder contact	Supports axial load transfer
Make-up torque	Ensures correct connection preload

Common Thread Failure Conditions



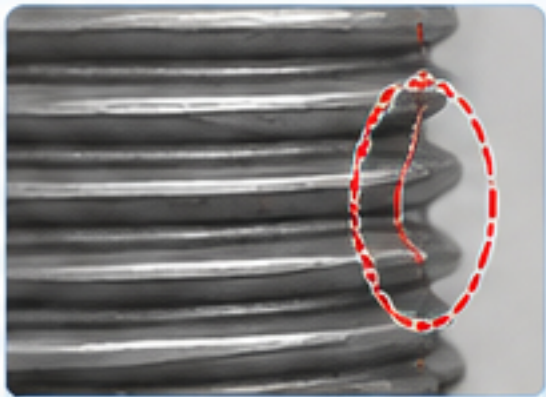
Thread wear

Loss of thread profile due to repeated loading



Thread galling

Adhesive wear and surface damage



Incomplete engagement

Insufficient make-up or thread mismatch

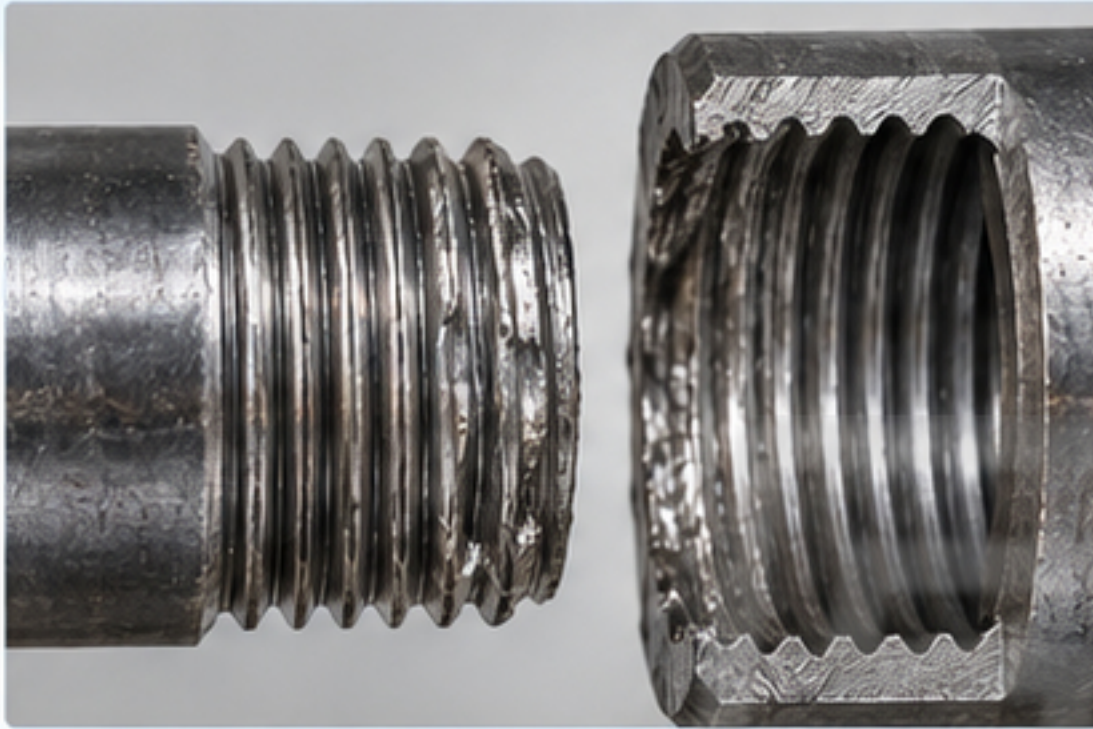


Proper thread geometry and correct make-up condition help distribute operating loads and reduce localized stress concentration during repeated pumping cycles.

Common Sucker Rod Coupling Failure Modes

Coupling failures are usually related to connection damage, excessive wear or improper operating conditions.

01 Thread Damage



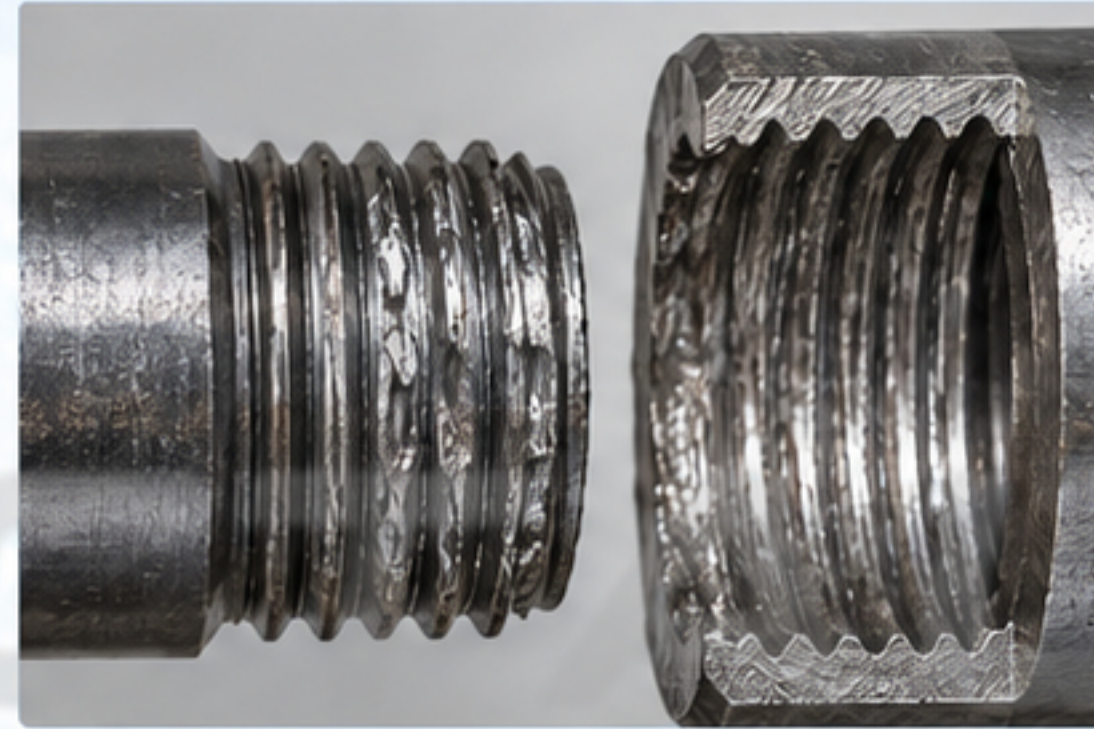
Cause

Improper make-up, contamination and repeated loading

Impact

Reduced connection strength

02 Thread Galling



Cause

Poor lubrication and surface damage

Impact

Difficult make-up and connection failure

03 Coupling Wear



Cause

Rod-tubing contact and well deviation

Impact

Reduced wall thickness

04 Corrosion Damage



Cause

Corrosive fluid exposure

Impact

Material degradation

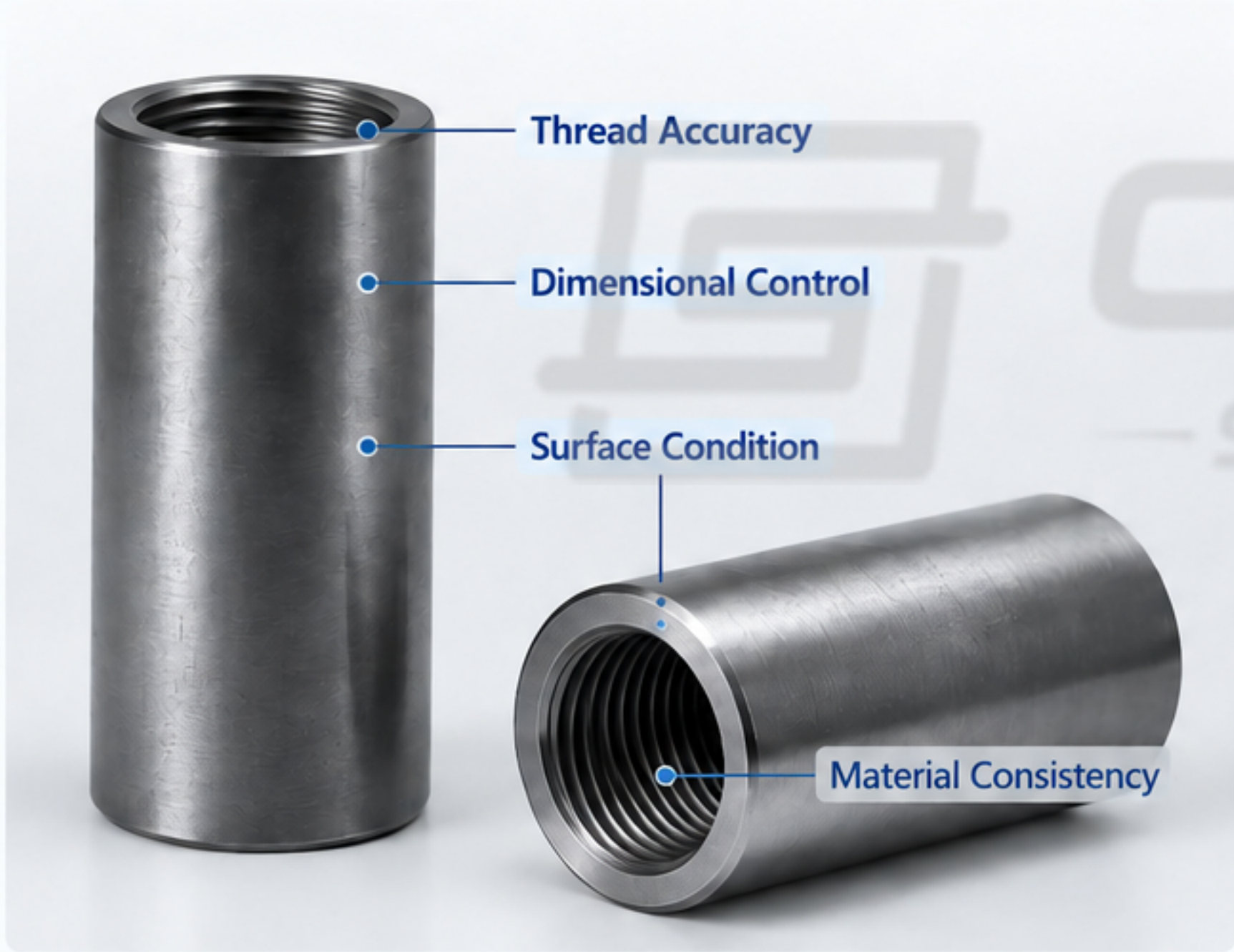


Failure mode identification helps improve coupling selection, operating control and inspection planning before connection reliability is affected.

Manufacturing Quality Control for Coupling Reliability

Manufacturing Control Overview

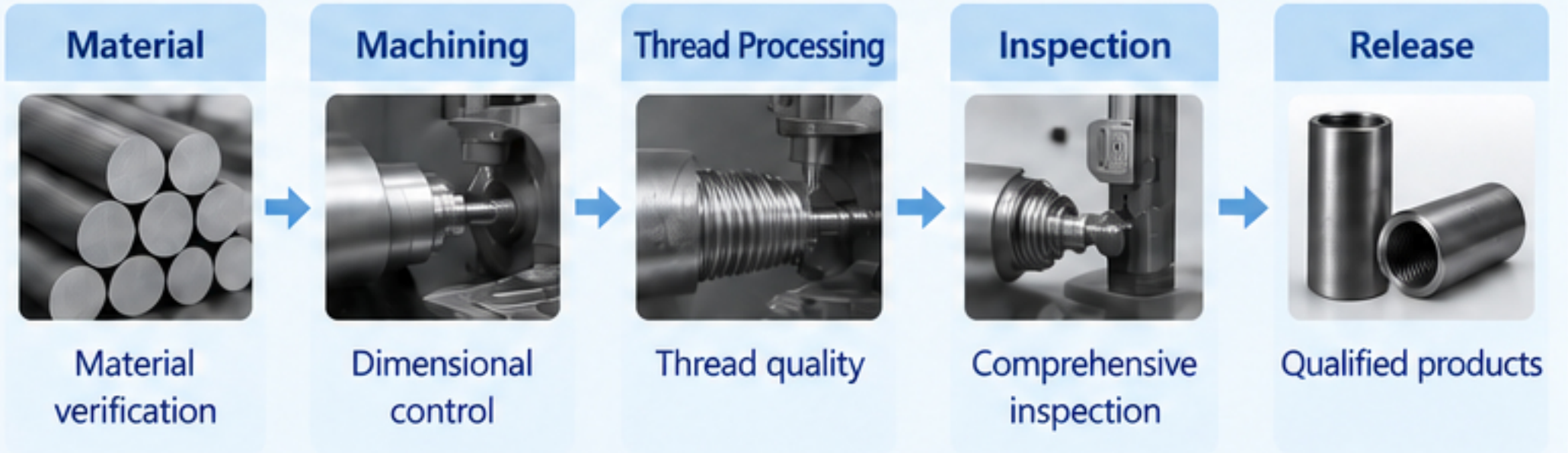
Manufacturing control focuses on maintaining thread accuracy, material consistency and final connection performance. Strict quality control helps prevent connection failures and ensure reliable operation in the field.



Quality Control Process

Inspection Stage	Control Purpose
Raw Material Verification	Confirm material identity and meet specifications
Machining Inspection	Control coupling dimensions and surface quality
Thread Inspection	Verify thread geometry and thread gauge
Hardness Testing	Confirm heat treatment result
Final Inspection	Verify finished condition and documentation

Inspection Flow



Strict manufacturing control and inspection help prevent connection failures and ensure reliable sucker rod coupling performance.

Connection Performance Verification

Connection performance should be verified through dimensional inspection, material records and applicable technical documentation.

Verification Overview

Before coupling supply or field installation, the connection should be checked against rod size, thread specification, critical dimensions and material requirements. Proper verification reduces the risk of mismatch, poor make-up and premature connection failure.



Verification Matrix

Item	Verification
01 Thread Compatibility	
Rod size	Confirm matching diameter
Thread type	Verify connection specification
Engagement	Confirm thread fit
02 Dimensional Control	
OD	Check coupling envelope
Length	Confirm specification
Bore	Verify internal geometry
03 Material Verification	
Grade	Confirm material requirement
Hardness	Verify treatment consistency
Traceability	Maintain heat records

04 Technical Documentation

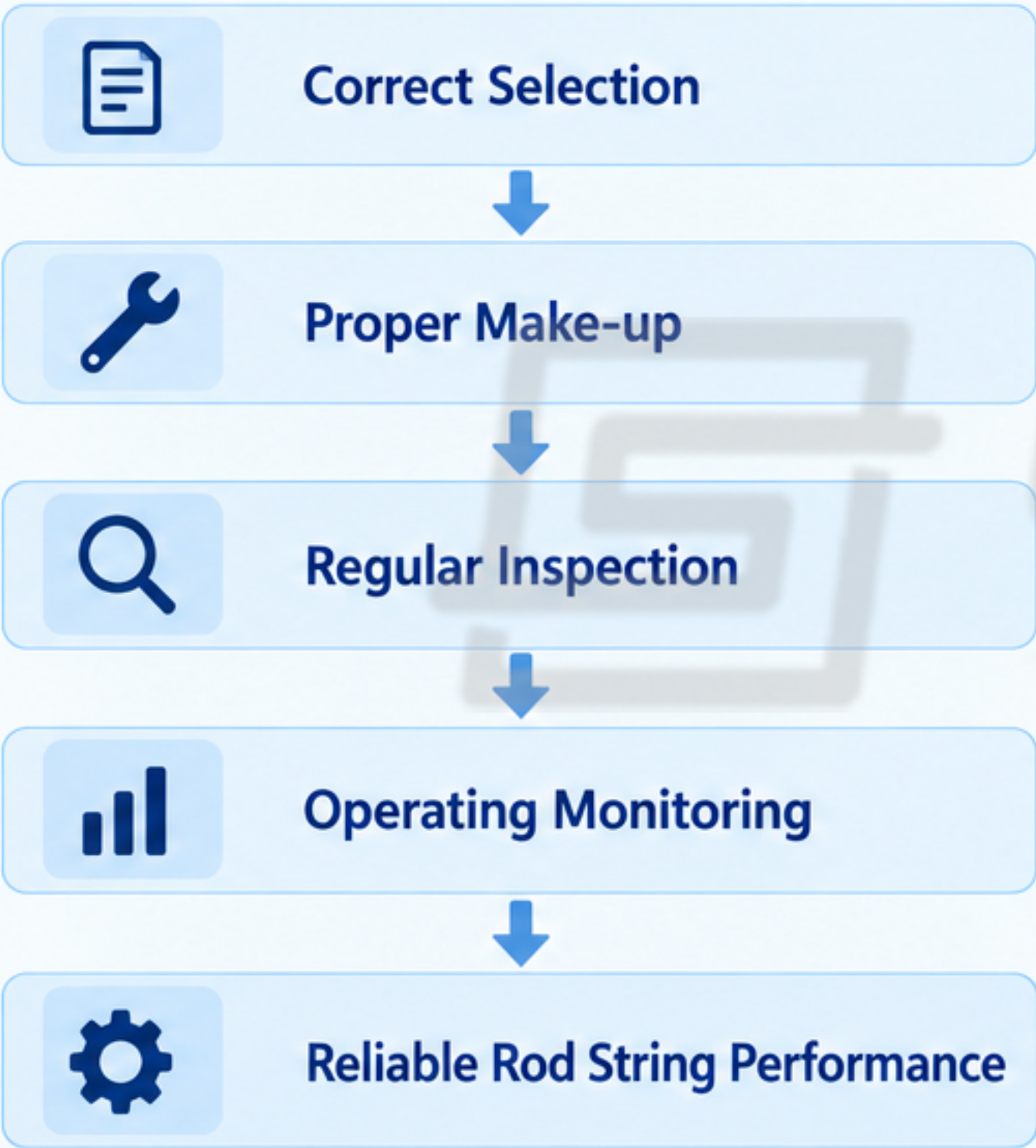
Document	Purpose
Approved drawing	Confirms dimensional basis
Material certificate	Verifies material compliance
Inspection record	Supports final acceptance



Verification of thread compatibility, critical dimensions, material consistency and technical records helps confirm reliable coupling performance before supply and installation.

Field Reliability and Preventive Measures

Failure Prevention Flow



Recommended Control Points

Stage	Focus
Before Installation	Confirm specification compatibility
During Operation	Monitor wear and abnormal loading
Maintenance	Check connection condition
Replacement	Verify matching components



Reliable sucker rod coupling performance depends on correct connection design, manufacturing control and continuous condition evaluation throughout the service life.