

OCTAL SUCKER ROD

API 11B

Sucker Rod Grade and Diameter Selection Guide

A practical engineering reference for selecting rod-body diameter, mechanical grade, pin-and-coupling configuration and inspection scope.

STANDARD

API Spec 11B

BODY SIZES

5/8 to 1 1/8 in.

LENGTHS

25 or 30 ft

OUTPUT

RFQ-ready
selection data

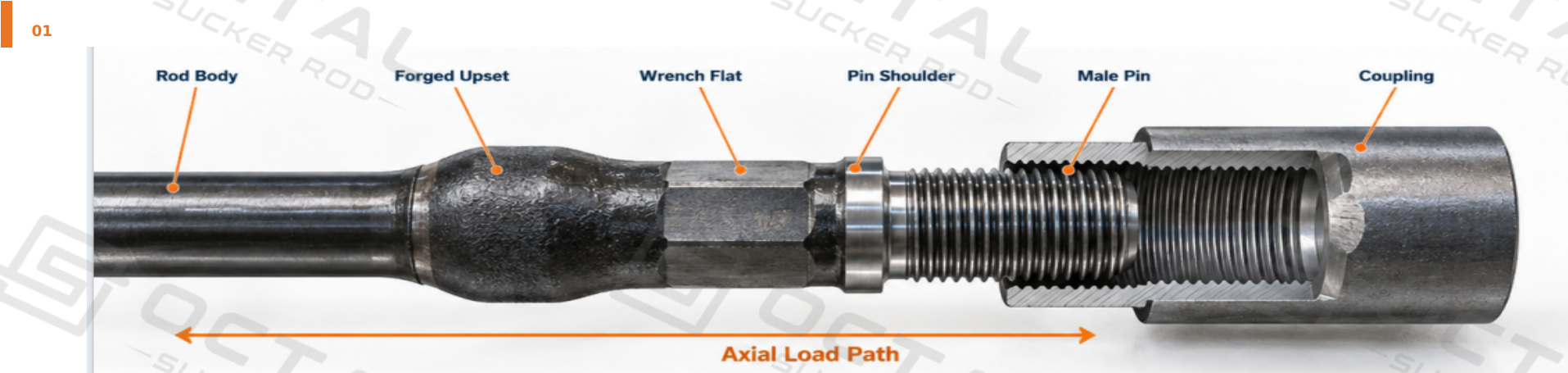


What an API 11B sucker rod is

Assembly geometry first; grade comes later.

A sucker rod is a solid steel tensile member that transfers reciprocating or rotary power from the surface drive to the downhole pump.

In service, the rod body, forged end, shoulder, male pin and coupling behave as one cyclic load path. A usable order therefore identifies the complete connection system, not only the rod-body diameter.



02

Standard body-to-pin matching

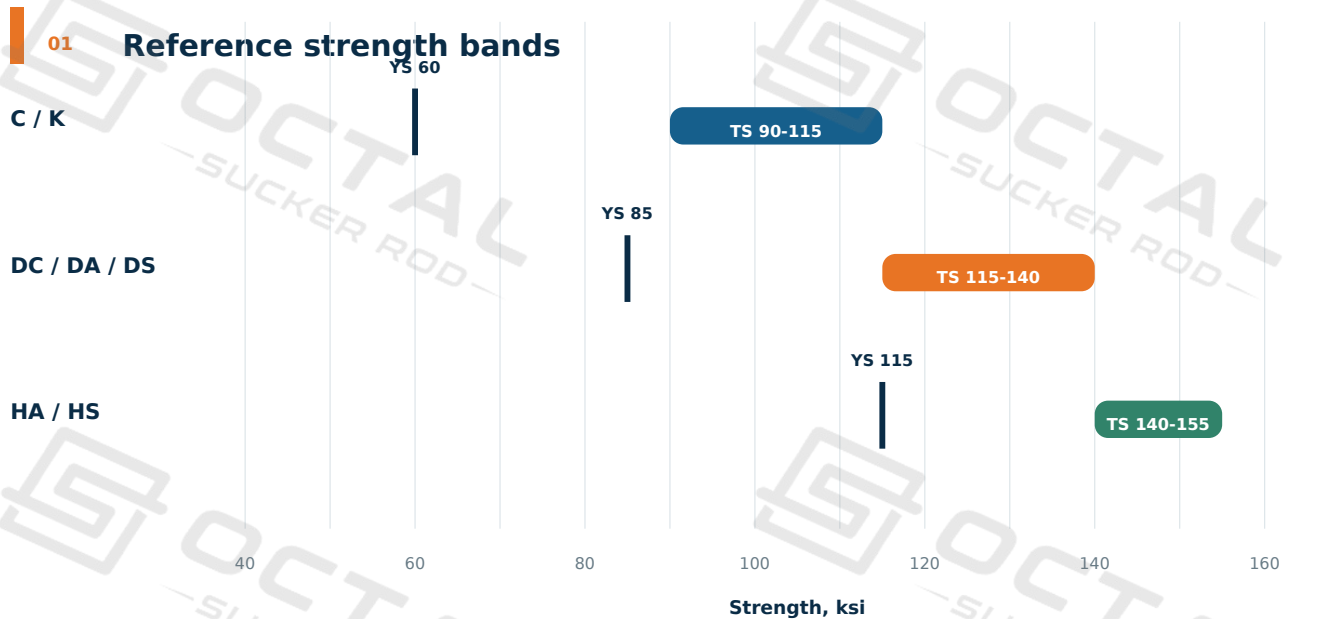
Rod-body diameter	Metric diameter	Typical API pin size	Nominal length
5/8 in.	15.88 mm	15/16 in.	25 or 30 ft
3/4 in.	19.05 mm	1 1/16 in.	25 or 30 ft
7/8 in.	22.23 mm	1 3/16 in.	25 or 30 ft
1 in.	25.40 mm	1 3/8 in.	25 or 30 ft
1 1/8 in.	28.58 mm	1 9/16 in.	25 or 30 ft

DO NOT MIX PRODUCT FORMS

Dimensions above describe standard steel sucker rods. Polished rods, sinker bars and fiberglass rods

Select a grade family from load and service

Strength is one input—not the entire failure analysis.



API steel-rod class family	Minimum yield	Tensile-strength range
C / K	60 ksi / 414 MPa	90–115 ksi / 621–793 MPa
DC / DA / DS	85 ksi / 586 MPa	115–140 ksi / 793–965 MPa
HA / HS	115 ksi / 793 MPa	140–155 ksi / 965–1,069 MPa

MATERIAL BOUNDARY

An API grade family does not define one universal AISI chemistry. State the API edition, exact class, approved manufacturing procedure, heat treatment, mechanical acceptance and marking in the purchase order.

02 Selection questions

LOAD

Peak/minimum polished-rod load, stress range, stroke and speed

TAPER

Diameter sequence, rod-string weight and connection capacity

FLUID

Water, CO₂, H₂S, chlorides, temperature and inhibitor history

GEOMETRY

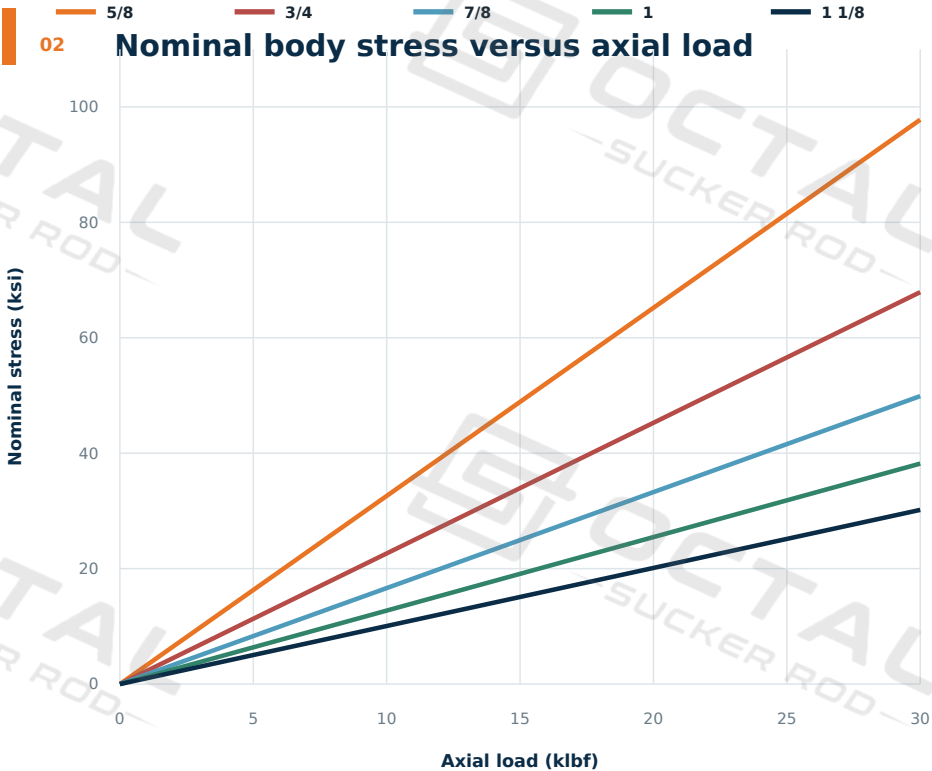
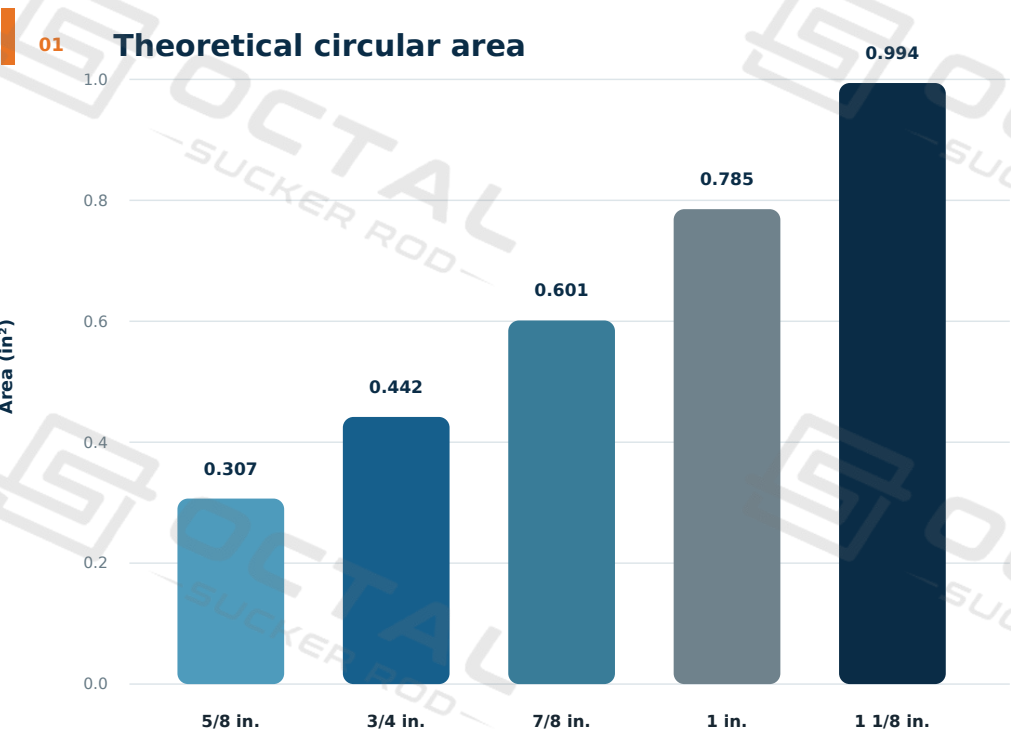
Deviation, dogleg severity, rod guides and tubing contact

FAILURE MODE

Overload, corrosion fatigue, bending, wear or connection damage

Diameter changes stress faster than it looks

Exact theoretical areas; simplified nominal body stress.



$$A = \pi d^2 / 4$$

$$\sigma = F / A$$

Calculated on nominal body diameter

Body diameter	Area, in²	Stress @ 20 klb, ksi	Stress @ 30 klb, ksi
5/8 in.	0.307	65.2	97.8
3/4 in.	0.442	45.3	67.9
7/8 in.	0.601	33.3	49.9
1 in.	0.785	25.5	38.2
1 1/8 in.	0.994	20.1	30.2

DESIGN BOUNDARY

These are nominal body stresses, not allowable loads. Dynamic acceleration, fluid load, fatigue, corrosion,

Match the rod string to the actual well

Depth alone cannot select grade or diameter.



01 Selection scenarios

DEEP / HIGH LOAD

Run the full load case; compare taper, body stress, connection capacity and rod-string weight.

DEVIATED WELL

Map dogleg/contact zones; check rod guides, coupling OD, tubing wear and buckling tendency.

CO₂ / H₂S / WATER

Define partial pressures, water chemistry, temperature and inhibitor history; higher strength alone is not corrosion control.

PCP SERVICE

Add torsional load, torque reversals and approved pin/coupling make-up to the axial-load review.

REPEAT FAILURE

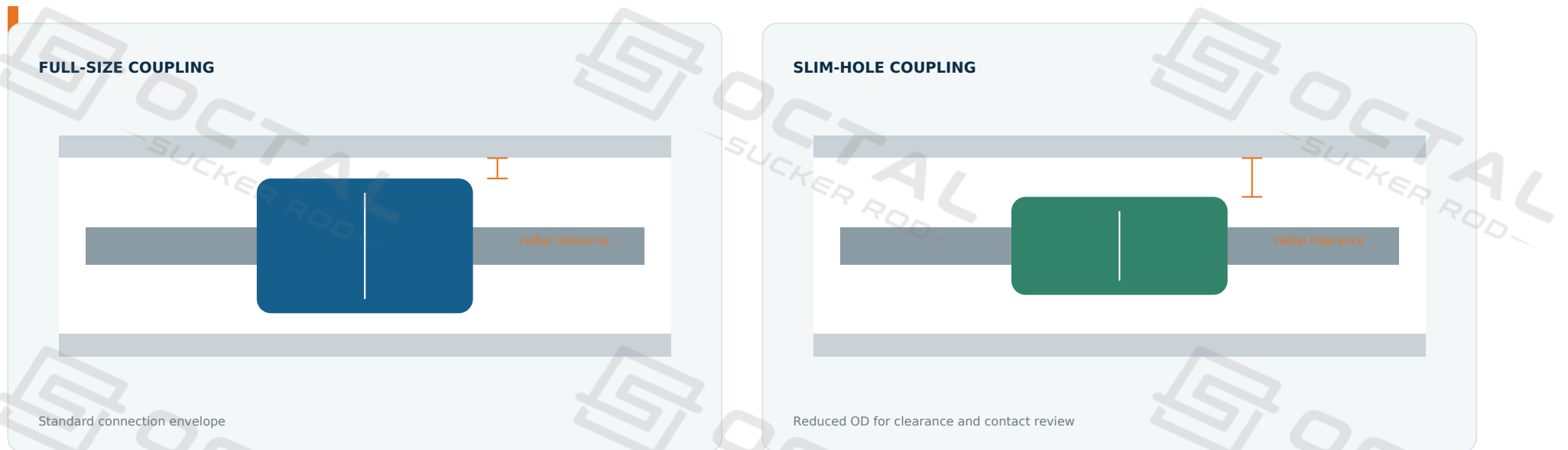
Identify fracture origin and mechanism before changing grade, diameter or surface treatment.

MINIMUM DATA BEFORE SELECTION

Pumping mode • peak/minimum load • stroke/speed • taper • deviation • tubing ID • produced-fluid chemistry • temperature •

The pin, coupling and tubing must fit together

Connection release is a dimensional and procedural check.



02 Release checks

PIN MATCH

Rod-body configuration and pin size match the installed string.

COUPLING OD

Tubing ID, drift, deviation and guide arrangement leave acceptable clearance.

THREAD / SHOULDER

Form, relief and shoulder condition meet the ordered gauge and visual criteria.

MATERIAL ROUTE

Coupling class, heat treatment and surface treatment are traceable.

MAKE-UP

Clean shoulders, approved compound and controlled make-up practice are defined.

EVIDENCE

Gauge records, calibration status, MTC/lot link and final protection are released.

PCP note: include torque, rotation direction, torque reversals and connection approval in addition to the axial-load case.

Release the product—and the evidence

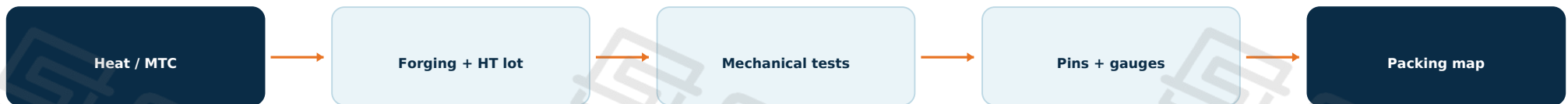
A marking is useful only when it links to the heat, lot and test record.



SOLID SUCKER-ROD END INSPECTION

A caliper can confirm accessible dimensions. Thread acceptance still requires the specified working gauges and calibrated inspection route.

02 Traceability chain



PROJECT-SPECIFIC COVERAGE

Write 100% dimensional checks, 100% pin gauging, forged-end MPI or full-length EMI/UT into the PO/ITP with method, coverage, sampling and acceptance criteria. Do not infer those levels from “API 11B compliant.”

01 Minimum release evidence

- **HEAT / CHEMISTRY**
MTC and heat identity
- **FORGED ENDS**
Visual + specified NDE record
- **HEAT TREATMENT**
Furnace chart and lot record
- **MECHANICAL TESTS**
Yield, tensile and ductility report
- **PIN / SHOULDER**
Gauge report + calibration register
- **FINAL LOT**
Marking and heat/lot packing map

Send enough data for a usable quotation

Eight fields prevent most size, connection and documentation gaps.

STANDARD BASIS

- 1 API Spec 11B edition, applicable addenda/errata and Monogram requirement

PRODUCT FORM

- 2 Sucker rod or pony rod; body diameter, pin size and nominal length

MECHANICAL GRADE

- 3 Exact API class or approved manufacturer-specific grade

COUPLING

- 4 Full-size/slim-hole, class, material route and surface treatment

QUANTITY

- 5 Rod count or total string length; taper quantities by size

WELL DATA

- 6 Loads, stroke/speed, deviation, tubing ID, temperature and produced-fluid chemistry

INSPECTION

- 7 ITP, NDE method/coverage, sampling, witness and hold points

DOCUMENTATION

- 8 MTC, CoC, tests, gauges, marking and heat/lot packing map

FASTEST TECHNICAL HANDOFF

Send the rod-string taper or required quantities together with the operating load case, tubing ID/deviation, fluid chemistry and requested inspection records.

REQUEST A TECHNICAL QUOTATION

www.suckerrod.com/products/

Standards basis

Prepared with reference to API Specification 11B, 28th Edition, and applicable published addenda/errata. Confirm the ordered edition and current API catalog status at the time of purchase. This guide does not replace the purchased standard, a qualified manufacturer MPS or a rod-string design calculation.