

API-COMPLIANT PUMP COUPLINGS



- Ten-point engineering specification framework for centrifugal pump drive trains.
- Scope: API 610, 11th edition (2010), particularly Clause 7.2.
- General-purpose and special-purpose coupling requirements must not be conflated.

MECHATRIC

Engineering specification
• vendor evaluation • RFQ
acceptance

Standards Hierarchy & Applicability

- API 610 / ISO 13709 governs centrifugal pumps and their drive-train interfaces.
- ISO 14691 covers general-purpose flexible couplings; ISO 10441 / API 671 covers special-purpose couplings.
- API 610 §7.2.4 requires these additional standards when specified.
- The purchaser must state the applicable edition, deviations and project-specific requirements.

KEY DISTINCTION

API 610 pump compliance does not automatically certify a coupling to API 671.

Default Coupling Configuration

- Default: all-metal flexible-element, spacer-type coupling, unless otherwise specified.
- Manufacture per AGMA 9000 Class 9; flexible elements of corrosion-resistant material.
- Positive spacer retention after flexible-element rupture; bolt heads alone may be inadequate.
- Steel hubs; alignability without dismantling the spacer.

SPECIFY

Type • element alloy •
spacer retention concept
• hub steel grade •
alignment provisions

DBSE & Maintenance Access

- For pumps other than OH types, DBSE must exceed seal-cartridge length OR be at least 125 mm, per §7.2.2(d).
- For BB and VS types, DBSE must exceed total seal length “l” in Table 7.
- Permit seal, bearing and rotor maintenance as applicable without moving hubs, driver or piping.
- Record DBSE on the pump data sheet for BB/VS pumps.

DESIGN REVIEW

Verify actual removal envelope, not merely nominal spacer dimension.

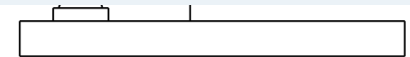


Figure 1 — Pump type OH1

e OH2

(source figure)

Power, Torque & Speed Rating

- Coupling and shaft interfaces must be rated for at least maximum driver power INCLUDING driver service factor.
- Use driver maximum power and governing operating speed to calculate required continuous torque.
- Engineering relation: $T \text{ [N}\cdot\text{m]} = 9550 \times P \text{ [kW]} / n \text{ [rpm]}$.
- Verify transients, startup, reversals and peak torque with supplier; not numerically prescribed by this clause.

EXAMPLE (ILLUSTRATIVE)

$P = 500 \text{ kW}$; $n = 1,500 \text{ rpm}$

$T = 3,183 \text{ N}\cdot\text{m}$ before any additional application-specific checks.

Balance & High-Speed Conditions

- At speeds above 3,800 r/min, component balancing and assembly balance check must meet ISO 10441 / API 671.
- If specified, ISO 1940-1 balance grade G6.3 is required.
- AGMA 9000 Class 9 is the default manufacturing potential-unbalance class.
- Check installed balance, runout and shaft dynamics as part of the complete train.

DO NOT CONFUSE

AGMA potential-unbalance classification, ISO balance quality grade, and special-purpose balance verification.

Shaft–Hub Interface Requirements

- Flexible couplings are keyed; AGMA 9002 Commercial Class governs keys, keyways and fits.
- Rectangular keys required; sled-runner keyways prohibited.
- For shaft diameters >60 mm when hub removal is needed for seal service: keyed taper fit 1:16 (diametral) by default.
- Interference-fit hubs require tapped puller holes ≥ 10 mm diameter.

VENDOR DATA

Shaft diameter • key geometry • fit • end float • thermal growth • puller-hole details

Optional Hub-Mounting Arrangements

- Hydraulic fitting is required only when specified.
- Proprietary clamping devices are permitted when specified; examples include taper bushes, locking assemblies and shrink discs.
- Final-bore machining vendor must select device size/rating.
- Non-self-centering designs may introduce eccentricity and unbalance: assess explicitly.

PURCHASER DECISION

Keyed taper / cylindrical
slip fit / hydraulic fit /
frictional locking device

Coupling Guards & Safety

- Each coupling needs a removable guard without disturbing the coupled elements.
- Guard must prevent personnel access and resist a 900 N static point load without contacting moving parts.
- Permitted constructions include sheet, plate and expanded metal; opening size ≤ 10 mm.
- Spark-resistant materials and ignition-hazard assessment apply only if specified.

CHECK

Material • access
openings • rigidity •
maintainability •
hazardous-area
requirements

RFQ & Compliance Verification Matrix

- Record standard editions and deviations; coupling configuration and materials.
- Capture maximum driver power/service factor, speed envelope, and torque cases.
- Specify DBSE, shaft ends, fits, keyways, thermal/end movements and maintainability.
- Obtain balance reports where required, spacer-retention evidence, guard drawings and vendor compliance matrix.
- Identify purchaser-specified options separately from default mandatory requirements.

ACCEPTANCE GATE

Compliant / Deviated /
Not Applicable / Evidence
Pending

Source scope: API 610
(2010) only; API 671 full
text not provided in this
attachment.

THANK YOU FOR YOUR ATTENTION

We Welcome Your Questions, Comments & Feedback

MECHATRIC

Power Transmission & Motion Solutions