

Wire rope inspection sheet: API RP 2D

One rope per sheet. How to fill it in: page 4. Mark ✓ nothing found, X found (write where and what), N/A does not apply. **Free analysis:** send us a photo of the completed sheet for a same-day response (page 2).

Date	Inspection type (codes: page 4)	Hours (machine or rope)	Inspector (print)	Boom angle (°)	Hook height (m) and hook load
Customer / owner	Site / location	Crane make	Crane model	Serial number	Unit number
Winch number	Winch duty (main hoist, aux, boom hoist)	Rope length (m / ft)	Nominal diameter d (mm)	Construction (e.g. 6x36 WS)	Core (IWRC, WSC)
Lay (ordinary / regular or Lang, direction)	Grade / finish	OEM specified breaking force (crane manual, not the mill cert)	Minimum breaking force (mill cert)	Date installed	Certificate number
Rope manufacturer / supplier	Drum: single or multi-layer	Sheaves: steel or synthetic	Usage category: Infrequent / Moderate / Heavy (5.1.2)	Initial lay length (mm) (CRS practice)	Rotation-resistant? Y / N
Hoist system: single-part / multi-part					

Your limits for this rope (how to work them out: page 6; tables: page 8)

Rope use (tick)	☐ a) Boom hoist running rope	☐ b) Rotation-resistant main or aux hoist	☐ c) Standing rope (pendant)	F.4.2
	☐ Other main or aux hoist (RP 2D sets no count)			
Allowed diameter reduction (tick)	☐ Up to and including 19.1 mm (3/4 in.): 1.2 mm	☐ 22.2 to 28.6 mm: 1.6 mm	☐ 31.8 to 38.1 mm: 3/32 in. (0.093 in.), see page 6: _____ mm	F.4.2 g)
	☐ Over 38.1 mm: 5% of baseline			
Your minimum diameter = baseline - allowed reduction	_____ mm			F.4.2 g)
Sheave grooves	Rope size (d): _____ Worn-sheave groove gauge used (API 9B): _____ (6.2.2.3, F.3 a))			

Baseline diameter (initial measurement at installation, non-working area; copy it from the installation record): _____ mm, measured at _____ m from the _____ end on (date) _____. D1 _____ mm, D2 _____ mm, averaged (CRS practice).

1. Diameter: D1 and D2 at right angles, average (D1 + D2) / 2 (averaging: CRS practice)

#	Measured at	D1 (mm)	D2 (mm)	Average (mm)
1.1	_____ m from the _____ end (working area)			
1.2	_____ m from the _____ end (working area)			
1.3	_____ m from the _____ end (working area)			
1.4	_____ m from the _____ end			
1.5	_____ m from the _____ end			
1.6	_____ m from the _____ end			

3. Other measurements

	Check	Reading	Where (m from which end)
3.1	Lay length now (mm), measured at the same place as the initial (CRS practice)		

Notes

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2. Broken wires: one line for every broken wire or group you find

	Where (m from which end)	Breaks in one lay	One strand, one lay	Random in 30d	One strand in 6d	Valley breaks in one lay	Breaks at end connection	Notes
2.1	___ m from the ___ end							
2.2	___ m from the ___ end							
2.3	___ m from the ___ end							
2.4	___ m from the ___ end							
2.5	___ m from the ___ end							
2.6	___ m from the ___ end							
2.7	___ m from the ___ end							
2.8	___ m from the ___ end							
2.9	___ m from the ___ end							
2.10	___ m from the ___ end							
2.11	___ m from the ___ end							

Fill in only the columns for the rope use ticked on page 1: boom hoist (a) and standing rope or pendant (c) count breaks in one lay length; rotation-resistant hoist (b) counts random breaks in 30d and breaks in one strand in 6d. Lay length: the distance along the rope in which one strand makes one complete turn around the core. Broken-wire limits: pages 6 and 8.

	Check	✓ / X / N/A	If X: where and what
4. Rope condition			
4.1	Kinking, crushing or other distortion		
4.2	Heat damage from any source (engine exhaust, flare towers, stress corrosion cracking, frozen or non-turning sheave, contact with crane structure, improperly grounded welding leads, lightning)		
4.3	Corrosion pitting on individual wires		
4.4	Internal or external corrosion without pitting		
4.5	Worn outside wires		
4.6	Cutting or un-stranding		
4.7	Improper reeving		
4.8	Lubrication (rope dry or poorly lubricated)		
4.9	Rope test (magnetic rope test or other non-destructive test), if one was done: date and result (CRS practice)		
5. Rope ends and drum			
5.1	Corroded or broken wires at end connections		
5.2	End connections corroded, cracked, bent, worn or improperly applied		
	Check	✓ / X / N/A	If X: where and what
5.3	Wedge socket: pin keeper fitted		
5.4	Wedge socket: correct size, live end on the straight side		
5.5	Wedge socket: eye and pin round and not worn, no burrs		
5.6	Wedge socket dead-end tail		
5.7	Wire rope clips (if fitted)		
5.8	Dead-end swivel		
5.9	Full wraps left on the drum in any operating condition		
5.10	Spooling: strand crushing, core protrusion, abrasion		
5.11	Spooling: excessive strand gaps, loose or uneven spooling, high stranding		
5.12	Re-spoiled under tension (where required and practical)		

6. Sheaves: one line per sheave (groove gauges: page 9; groove limits: page 1)

	Sheave (which one)	Worn-sheave gauge seats? Y / N (F.3 a))	Groove wear: corrugation (rope imprint, negative impressions), cracks or chips in the rope path (F.3): ✓ / X	Flange broken or chipped, hub cracked (F.3): ✓ / X	Bearing wear, drag, rope path alignment (F.3, B.3.4 c): ✓ / X	If X: where and what
6.1						
6.2						
6.3						
6.4						
6.5						

QO / QI decision: removed now, or limited use until (date) (F.4.1)

Usage category and next inspection due

Inspector name and initials (5.2.2)

Date



Wire rope inspection: API RP 2D

A free inspection sheet and guide from Crane Rope Solutions. It shows what API RP 2D asks you to check and record, and how to record it. One rope per inspection sheet.

How to use this guide

1. Work out your limits for this rope once (page 6) and write them at the top of page 1.
2. Inspect the rope and fill in the inspection sheet, pages 1 and 2. How to fill it in: page 4. A filled-in example is on pages 10 and 11.
3. Send us a photo of the completed sheet for a free analysis (below).

WHO

Pre-use and monthly: qualified crane operator (QO); a qualified inspector (QI) may also perform them (5.1.3.3, 5.1.3.4). Quarterly and annual: qualified inspector (QI) (5.1.3, Figure 3).

WHEN

By usage category (5.1.2): Infrequent (10 h/month or less): pre-use and annual; if idle three months or more, a monthly inspection and a full function operation check (shall). Moderate (over 10, under 50 h/month): pre-use, quarterly, annual. Heavy (50 h/month or more): pre-use, monthly, quarterly, annual. If not documented, the crane should default to Heavy (B.2.1.1). Annual every 12 months on all cranes (5.1.3.6). Additional rope inspection (F.2) should be performed by QIs at quarterly and annual inspections, as pre-use and monthly results warrant (6.2.2.2); at quarterly and annual inspections, or when ropes are changed, the F.2 and F.3 areas should be checked (6.2.2.4).

HOW MUCH ROPE

Pre-use and monthly: visual inspection of the rope by the QO (6.2.2.2, should). Quarterly and annual: additional inspection per F.2 by the QI, as pre-use and monthly results warrant (6.2.2.2); F.2 and F.3 areas checked at quarterly and annual inspections and at rope changes (6.2.2.4).

Have on hand

- The initial wire rope measurements taken at installation (6.2.1), and the crane owner's written wire rope policy (6.1.1).
- Tools: steel tape measure, sheave groove gauges for worn sheaves per API 9B, quality calipers and/or micrometers accurate to at least 0.001 in. (0.025 mm), chalk (6.2.2.3).
- Previous inspection records for this rope (6.2.3.2).

Look closely at these areas (F.2 g) (shall))

- Equalizer sheaves or saddles (fixed guides) and other sheaves
- End connections, sockets and end attachments of running and standing ropes
- Rope continually running over sheaves in the hoist systems
- Crossover and flange points on the hoist drums
- Where boom angle and load block moves are frequent and short (F.2 g))



Send it to us: free analysis, same-day response

When you finish the sheet, take a clear photo of both pages and text it to **604-813-WIRE (9473)** (scan the code), or email it to **dean@craneropesolutions.com**. Add photos of anything you marked X, with a tape or ruler in the frame. We send back our analysis the same day.

A photo review is advice only. It does not replace the inspection the standard requires; the decision stays with the qualified crane operator or qualified inspector.

API RP 2D, Operation and maintenance of offshore cranes. Clause numbers in brackets point to the standard. Text marked Crane Rope Solutions (CRS) practice is our method, not the standard.



How to fill in the inspection sheet

1 Top of page 1: the inspection, crane and rope

- Date, inspection type (codes below), hours, your name, and the crane set-up at the time: RP 2D covers offshore pedestal-mounted cranes (1.1): write the boom angle. Hook height and hook load (none, block only, or tonnes). Set the crane up the same way each time if you can, so the same part of the rope sits at your points (CRS practice).
- Rope details from the mill certificate (size, construction, core, lay, grade, minimum breaking force) and the crane manual (OEM specified breaking force).

2 Your limits (page 1)

- Work them out once for this rope with page 6 and copy them onto each new sheet.

3 Section 1: diameter

- Measure across the crowns of the strands, not into the valleys (Figure F.6). RP 2D compares the lowest of three working areas with the baseline (F.4.2 g)). Take two readings at right angles and average them (CRS practice); if one reading alone is below your minimum, note it for the QO / QI (CRS practice). Use calipers with jaws wide enough to span at least two strands (CRS practice).
- Points 1.1 to 1.3 are the three working areas; 1.4 to 1.6 are extra points, for example the smallest diameter you find.
- For each point, write how far along the rope it is from the drum end or from the dead end (picture on page 5). Measure the distance with a tape measure, or read it from a rope counter, and mark the spot on the rope with a paint pen so the next inspection measures the same place (CRS practice).
- Baseline diameter: from the initial wire rope measurements taken at installation, in a non-working area away from the sheaves (6.2.1, F.4.2 g)). Copy it from the installation record.

4 Section 2: broken wires

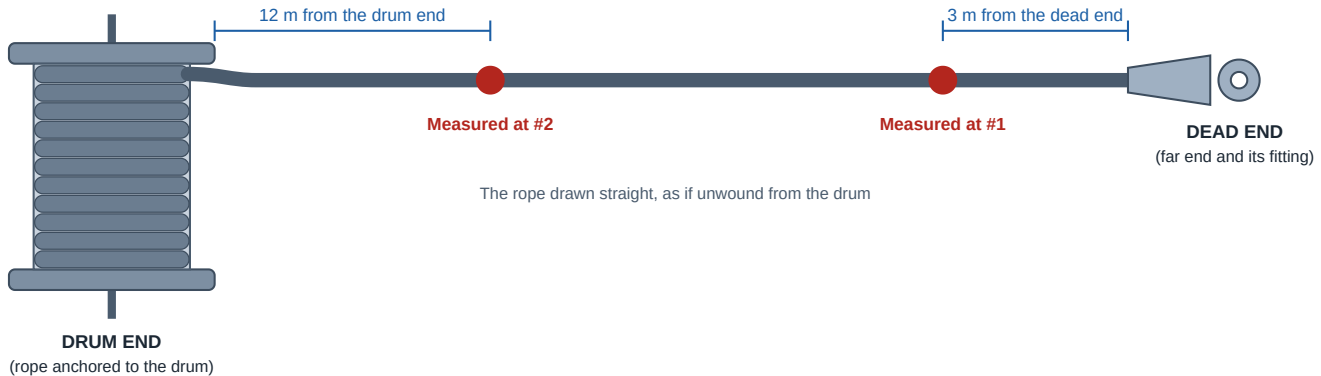
- Look along the rope this inspection covers (page 3). Write one line for every broken wire, or group of broken wires, that you find, and mark each spot on the rope with a paint pen (CRS practice).
- For each line, write how far along the rope it is from the drum end or the dead end. In each count column, write the most breaks in any one lay length, 30d or 6d (as the column says) that includes this spot. RP 2D says "30 rope diameters" and "six rope diameters"; using nominal d is CRS practice: for a 28 mm rope, 6d = 168 mm and 30d = 840 mm.
- Fill in only the columns for the rope use ticked on page 1: boom hoist (a) and standing rope or pendant (c) count breaks in one lay length; rotation-resistant hoist (b) counts random breaks in 30d and breaks in one strand in 6d. Lay length: the distance along the rope in which one strand makes one complete turn around the core.

Inspection type codes

I initial PU pre-use M monthly Q quarterly A annual (5.1.3) O other: rope change (6.2.2.4); more often once broken wires appear (F.4.2)



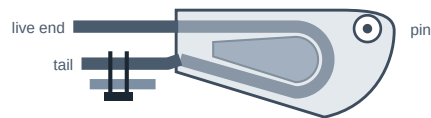
Finding your points again



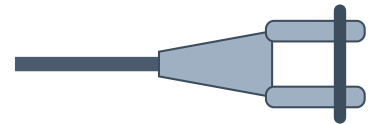
Common dead-end fittings (Crane Rope Solutions illustration)



Button (swaged or poured)



Wedge socket



Open spelter socket (pin through the jaws)

5 Sections 3 to 6: everything else

- Measurements: write the reading and where. Checks: mark ✓ nothing found, X found, N/A does not apply. For every X, write where it is (m from which end, or which part) and what you found in the same row.
- Corrosion (rows 4.3 and 4.4): pitting on the surface of individual wires goes in row 4.3 (F.4.2 i)); corrosion without pitting goes in row 4.4 (F.2 a)). Write where it is.
- Sheaves (section 6): one line per sheave, named so you can find it again (for example "Boom tip 2"). Groove: write Y if the worn-sheave gauge seats in the groove, N if it does not (page 9). Then mark ✓ or X for groove wear, flange and bearing as the column headings say, and for every X write what and where in the last column. Negative impressions: the pattern of the rope's strands pressed or worn into the groove.

6 Sign and send

- Sign or initial, write the next inspection due, and send us a photo of both pages for a free analysis and a same-day response.



Your limits from API RP 2D

Work these out once for each rope and write them on page 1. Then the rules below tell you what each finding means. **FAIL** the standard says (shall) the item must be put right; an unsafe condition means the crane is taken out of service or its operation restricted (5.3.3.1). **SHOULD** the standard recommends (should) it; the qualified crane operator or qualified inspector decides (F.4.1). **EVALUATE** no fixed limit; the qualified crane operator or qualified inspector judges it. Rows not listed are for the record only.

A. Broken-wire limits

- Tick what the rope does on page 1: boom hoist, rotation-resistant main or auxiliary hoist, standing rope (pendant), or another main or auxiliary hoist rope.
- The broken-wire limits for each are on page 8. RP 2D gives no count for main or auxiliary hoist rope that is not rotation-resistant: record the number and concentration of broken outside wires (F.2 b)).

B. Minimum diameter

- Copy the baseline from the initial measurement taken at installation, in a non-working area away from the sheaves (6.2.1, F.4.2 g)).
- Tick the allowed reduction for the rope size on page 1 (31.8 to 38.1 mm rope: read the note on page 6). Minimum diameter = baseline - allowed reduction.
- Example: 3/4 in. (19 mm) rope, baseline 19.4 mm, allowed 1.2 mm. Minimum = 18.2 mm. If the lowest of the three working areas is below 18.2 mm, the rope should be replaced.

C. Other limits

- Other minimums: wedge socket tails (Figure F.8) and full wraps left on the drum (4.2.3.7). See the rules below.
- 31.8 to 38.1 mm (1 1/4 to 1 1/2 in.) rope: F.4.2 g) allows 3/32 in. (0.093 in.). Confirm the millimetre value in the owner's written policy and write it on page 1 (CRS practice).
- The crane owner shall have a written wire rope policy with rejection criteria and a replacement schedule (6.1.1). For sizes between the RP 2D bands (19.1 to 22.2 mm, 28.6 to 31.8 mm), use that policy (CRS practice).
- F.4.1: these criteria are based on use under maximum load conditions. The rope should be replaced if any are found; limited use can continue until it is replaced; this determination shall be made by a QO or QI.

D. Rules for the sheet rows

Row	Check	Rule	Clause
1.1 to 1.3	Lowest working-area average	SHOULD Lowest working area below your minimum (page 1): a reduction of more than the allowance	F.4.2 g)
1	Diameter below nominal d	EVALUATE QO / QI decides (wear, loss of core support, corrosion)	F.2 a)
2	a) Boom hoist: random broken wires in one lay length	SHOULD 6 or more	F.4.2 a)
2	a) Boom hoist: broken wires in one strand in one lay length	SHOULD 3 or more	F.4.2 a)
2	b) Rotation-resistant hoist: random broken wires in 30d	SHOULD 4 or more	F.4.2 b)
2	b) Rotation-resistant hoist: broken wires in one strand in 6d	SHOULD 2 or more	F.4.2 b)
2	c) Standing rope: broken wires in one lay length	SHOULD 3 or more	F.4.2 c)
2	c) Standing rope: broken wires at the end connection	SHOULD 2 or more	F.4.2 c)
2	Valley breaks in one lay length	SHOULD 1 or more: the rope should be retired. One valley break: inspect that section closely	F.4.2 d)
2	Other main or aux hoist rope: number and concentration of broken outside wires (location: CRS practice)	EVALUATE RP 2D sets no count: QO / QI decides	F.2 b)
2	Broken wires found (any rope)	SHOULD When broken wires appear, inspections should be at more frequent intervals	F.4.2
3.1	Lay length now (mm), measured at the same place as the initial (CRS practice)	SHOULD Any increase over the initial lay length	F.2 a), F.4.2 h)
4.1	Kinking, crushing or other distortion	SHOULD Any	F.4.2 e)
4.2	Heat damage from any source (engine exhaust, flare towers, stress corrosion cracking, frozen or non-turning sheave, contact with crane structure, improperly grounded welding leads, lightning)	SHOULD Any evidence	F.4.2 f)
4.3	Corrosion pitting on individual wires	SHOULD Pitting on the wire surface	F.4.2 i)
4.4	Internal or external corrosion without pitting	EVALUATE QO / QI decides	F.2 a)
4.5	Worn outside wires	EVALUATE Corrective action as appropriate	F.2 c), 6.2.2.4
4.6	Cutting or un-stranding	EVALUATE Corrective action as appropriate	F.2 e), 6.2.2.4
4.7	Improper reeving	EVALUATE QO / QI decides	B.3.2 h)
4.8	Lubrication (rope dry or poorly lubricated)	SHOULD Rope should be maintained in a well-lubricated condition; do not apply used oil	6.2.4.10



Row	Check	Rule	Clause
5.1	Corroded or broken wires at end connections	EVALUATE Standing rope: 2 at the end connection = SHOULD (section 2)	F.2 d)
5.2	End connections corroded, cracked, bent, worn or improperly applied	EVALUATE Corrective action as appropriate	F.2 d), 6.2.2.4
5.3	Wedge socket: pin keeper fitted	FAIL Missing: a pin keeper shall always be used	F.7 a)
5.4	Wedge socket: correct size, live end on the straight side	FAIL Not as F.7: wedge sockets shall be properly installed	6.2.4.9, F.7
5.5	Wedge socket: eye and pin round and not worn, no burrs	EVALUATE Check for roundness and wear (F.7 a), b)); corrective action as appropriate	F.7
5.6	Wedge socket dead-end tail	SHOULD Under 6 d (min 6 in.) on boom suspension rope, or under 20 d (min 6 in.) on rotation-resistant hoist rope; secured per Figure F.8	F.7 d), Figure F.8
5.7	Wire rope clips (if fitted)	FAIL Not drop-forged steel, U-bolt not on the dead end, or nuts not retightened after first load	6.2.4.8
5.8	Dead-end swivel	FAIL On a multi-part RR hoist without the crane and rope makers' recommendation; single-part not as recommended	F.6.7, F.6.8
5.9	Full wraps left on the drum in any operating condition	SHOULD Fewer than 5	4.2.3.7
5.10	Spooling: strand crushing, core protrusion, abrasion	EVALUATE Corrective action as appropriate	F.2 f)
5.11	Spooling: excessive strand gaps, loose or uneven spooling, high stranding	EVALUATE Corrective action as appropriate	F.2 f)
5.12	Re-spoiled under tension (where required and practical)	SHOULD Re-spool the drum under tension where required and practical (all inspections except pre-use). Mark ✓ if re-spoiled or not needed, X if needed but not done	F.9 c)

E. Sheaves (section 6)

EVALUATE Worn-groove gauge will not seat, corrugation (rope imprint), broken or chipped flange, cracked hub, drag, bearing wear, cracks or chips in the rope path, poor rope path alignment: corrective action as appropriate (F.3, B.3.4 c), 6.2.2.4).

When: Full sheave inspection (F.3) at quarterly and annual inspections and whenever ropes are changed (6.2.2.4).

F. After the inspection

Limit reached: A rejection criterion is reached: the rope should be replaced; limited use can continue until it is replaced, and this determination shall be made by a QO or QI (F.4.1). Rope unfit for use shall be removed from service and identified as unfit for use (6.2.3.3).

Corrective actions: Unsafe condition: the crane is taken out of service or its use restricted (5.3.3.1, shall). Correct deficiencies found at inspections (B.3.2 k), B.3.3 d), B.3.4 i), should). Records of repairs should be kept readily available for 4 years (5.2.2).

Records: Initial, monthly, quarterly and annual reports: written, dated and initialed, naming the inspector; kept readily available for 4 years (5.2.2, should). All Annex F rope deficiencies shall be recorded (6.2.3.2); keep them until the rope is replaced (should). Pre-use rope checks should go in the pre-use log (5.2.1). If lubricated: type, amount and method (6.1.2).



Broken-wire rejection criteria

API RP 2D lists its broken-wire rejection criteria by rope use (F.4.2). When one is reached the rope should be replaced; a qualified crane operator or qualified inspector decides whether limited use can continue until then (F.4.1).

Rope	Reject when (F.4.2)
a) Running ropes used in the boom hoist	Six randomly distributed broken wires within one lay length; three broken wires in one strand within one lay length
b) Running ropes of rotation-resistant construction in the main or auxiliary hoist	Four randomly distributed broken wires within 30 rope diameters; two broken wires in one strand within six rope diameters
c) Standing ropes such as boom pendants	Three broken wires within one lay length; two broken wires at the end connection
d) Valley breaks (any rope)	One valley break calls for close inspection of that section; when one or more valley breaks are found in one lay length, the rope should be retired

F.4.2 lists no separate broken-wire count for main or auxiliary hoist rope that is not rotation-resistant; record the number and concentration of broken outside wires (F.2 b)); recording the location and referring it to a QO or QI is Crane Rope Solutions practice. When broken wires appear, the inspections should be at more frequent intervals (F.4.2). Valley breaks are more detrimental than surface breaks. Summarized from API RP 2D F.4.2 for field reference.

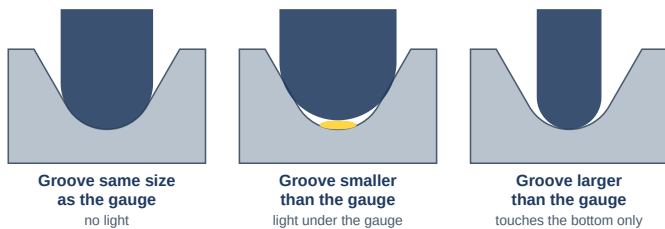


Checking sheave grooves with groove gauges

There are two types of groove gauge: **go / no-go gauges** and **actual size gauges**. How to use them, and what to do about a groove outside the limits, is Crane Rope Solutions practice unless a clause is given.

1. Go / no-go gauges

1. Clean the groove so the gauge sits on bare metal, not grease or dirt.
2. Use the sheave groove gauge for worn sheaves for your rope size, used in accordance with API 9B (6.2.2.3, F.3 a)).
3. Place it into the groove, square to the sheave. **Plastic gauges: do not push down hard.** They flex, and pressing down can easily give a wrong reading, so plastic gauges are not the best choice. Crane-specific steel groove gauges are available at craneropesolutions.com.
4. Shine a flashlight behind the gauge.
5. **The gauge will not seat** (light under it, middle picture): take corrective action as appropriate (6.2.2.4).
6. **Touches only the bottom, with gaps at both sides** (right picture): the groove is larger than the gauge: write the size and ask the QI.
7. Check several places around each sheave. In section 6 of the sheet write Y if the worn-sheave gauge seats, N if it does not.



2. Actual size gauges

Crane Rope Solutions offers actual size gauges in 0.25 mm steps. Try gauges until you find the one that best fills the groove without letting light underneath it. That gauge is your true groove size. Write the size next to the sheave name in section 6 of the sheet.

Check it against the limit. Use the worn-sheave gauge (API 9B) or your owner's written policy.

Why we prefer actual size gauges

A go / no-go gauge only tells you pass or fail. An actual size gauge shows how much wear is left, so your maintenance plan can move from pass, pass, pass, fail to 100% life remaining, 75%, 50%, 25%, replace.

What API RP 2D says. Use sheave groove gauges for worn sheaves, used in accordance with API 9B (6.2.2.3, F.3 a)). If the gauge will not seat, take corrective action as appropriate (6.2.2.4).



Don't have gauges? Scan to see our groove gauges.

Want a free gauge? Give us a shot at quoting your wire ropes and we will send you a free groove gauge, just to say thank you.

604-813-WIRE (9473) | dean@craneropesolutions.com



EXAMPLE, made-up readings. A 28 mm rope filled in to show how the sheet works. Your blank sheet is pages 1 and 2.

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One rope per sheet. How to fill it in: page 4. Mark ✓ nothing found, X found (write where and what), N/A does not apply. **Free analysis:** send us a photo of the completed sheet for a same-day response (page 2).

Date 2026-04-03	Inspection type (codes: page 4) M	Hours (machine or rope) 4,318	Inspector (print) J. Smith	Boom angle (°) 60 deg	Hook height (m) and hook load 15 m, block
Customer / owner Example Crane Co.	Site / location Vancouver yard	Crane make ABC Cranes	Crane model Example 100T	Serial number EX-12345	Unit number 12
Winch number W2	Winch duty (main hoist, aux, boom hoist) Boom hoist	Rope length (m / ft) 210 m	Nominal diameter d (mm) 28	Construction (e.g. 6x36 WS) 8x26 WS	Core (IWRC, WSC) IWRC
Lay (ordinary / regular or Lang, direction) Right regular lay	Grade / finish 1960 / bright	OEM specified breaking force (crane manual, not the mill cert) Per crane manual	Minimum breaking force (mill cert) Per mill cert	Date installed 2025-12-15	Certificate number EX-0001
Rope manufacturer / supplier Crane Rope Solutions	Drum: single or multi-layer Multi-layer	Sheaves: steel or synthetic Steel	Usage category: Infrequent / Moderate / Heavy (5.1.2) Heavy (50 h/month or more)	Initial lay length (mm) (CRS practice) 190	Rotation-resistant? Y / N N
Hoist system: single-part / multi-part Multi-part					

Your limits for this rope (how to work them out: page 6; tables: page 8)

Rope use (tick)	☒ a) Boom hoist running rope ☐ Other main or aux hoist (RP 2D sets no count)	☐ b) Rotation-resistant main or aux hoist	☐ c) Standing rope (pendant)	F.4.2
Allowed diameter reduction (tick)	☐ Up to and including 19.1 mm (3/4 in.): 1.2 mm ☐ Over 38.1 mm: 5% of baseline	☒ 22.2 to 28.6 mm: 1.6 mm	☐ 31.8 to 38.1 mm: 3/32 in. (0.093 in.), see page 6: _____ mm	F.4.2 g)
Your minimum diameter = baseline - allowed reduction	27.24 mm			F.4.2 g)
Sheave grooves	Rope size (d): 28 mm Worn-sheave groove gauge used (API 9B): API 9B worn gauge, 28 mm (6.2.2.3, F.3 a))			

Baseline diameter (initial measurement at installation, non-working area; copy it from the installation record): **28.84** mm, measured at **3** m from the **dead** end on (date) **2025-12-15**. D1 **28.88** mm, D2 **28.80** mm, averaged (CRS practice).

1. Diameter: D1 and D2 at right angles, average (D1 + D2) / 2 (averaging: CRS practice)

#	Measured at	D1 (mm)	D2 (mm)	Average (mm)
1.1	3 m from the dead end (working area)	28.62	28.54	28.58
1.2	120 m from the drum end (working area)	28.50	28.42	28.46
1.3	150 m from the drum end (working area)	28.76	28.72	28.74
1.4	180 m from the drum end	28.80	28.74	28.77
1.5	____ m from the ____ end			
1.6	____ m from the ____ end			

3. Other measurements

	Check	Reading	Where (m from which end)
3.1	Lay length now (mm), measured at the same place as the initial (CRS practice)	190	3 m from the dead end

Reading this example: 28 mm is in the "22.2 to 28.6 mm" band, so the allowed reduction is 1.6 mm. The baseline taken in a non-working area is 28.84 mm, so the minimum is 28.84 - 1.6 = 27.24 mm. Boom hoist running rope, so row a) applies: 6 random broken wires or 3 in one strand in one lay length.

Reading this example: The lowest average at this inspection is 28.46 mm at point 1.2 (120 m from the drum end). The minimum diameter at the top of this sheet is 27.24 mm, so every reading passes.



EXAMPLE, made-up readings. Page 2 of the example sheet.**2. Broken wires: one line for every broken wire or group you find**

	Where (m from which end)	Breaks in one lay	One strand, one lay	Random in 30d	One strand in 6d	Valley breaks in one lay	Breaks at end connection	Notes
2.1	120 m from the drum end	3	1	N/A	N/A	0	0	Boom hoist: row a)
2.2	___ m from the ___ end							
2.3	___ m from the ___ end							

Fill in only the columns for the rope use ticked on page 1: boom hoist (a) and standing rope or pendant (c) count breaks in one lay length; rotation-resistant hoist (b) counts random breaks in 30d and breaks in one strand in 6d. Lay length: the distance along the rope in which one strand makes one complete turn around the core. Broken-wire limits: pages 6 and 8.

	Check	✓ / X / N/A	If X: where and what		Check	✓ / X / N/A	If X: where and what
4. Rope condition							
4.1	Kinking, crushing or other distortion	✓		5.3	Wedge socket: pin keeper fitted	✓	
4.2	Heat damage from any source (engine exhaust, flare towers, stress corrosion cracking, frozen or non-turning sheave, contact with crane structure, improperly grounded welding leads, lightning)	✓		5.4	Wedge socket: correct size, live end on the straight side	✓	
4.3	Corrosion pitting on individual wires	✓		5.5	Wedge socket: eye and pin round and not worn, no burrs	✓	
4.4	Internal or external corrosion without pitting	✓		5.6	Wedge socket dead-end tail	✓	
4.5	Worn outside wires	✓		5.7	Wire rope clips (if fitted)	N/A	
4.6	Cutting or un-stranding	✓		5.8	Dead-end swivel	N/A	
4.7	Improper reeving	✓		5.9	Full wraps left on the drum in any operating condition	✓	
4.8	Lubrication (rope dry or poorly lubricated)	X	30-40 m from drum end: dry; lubricated	5.10	Spooling: strand crushing, core protrusion, abrasion	✓	
4.9	Rope test (magnetic rope test or other non-destructive test), if one was done: date and result (CRS practice)	N/A		5.11	Spooling: excessive strand gaps, loose or uneven spooling, high stranding	✓	
5. Rope ends and drum				5.12	Re-spooled under tension (where required and practical)	✓	
5.1	Corroded or broken wires at end connections	✓					
5.2	End connections corroded, cracked, bent, worn or improperly applied	✓					

6. Sheaves: one line per sheave (groove gauges: page 9; groove limits: page 1)

	Sheave (which one)	Worn-sheave gauge seats? Y / N (F.3 a))	Groove wear: corrugation (rope imprint, negative impressions), cracks or chips in the rope path (F.3): ✓ / X	Flange broken or chipped, hub cracked (F.3): ✓ / X	Bearing wear, drag, rope path alignment (F.3, B.3.4 c)): ✓ / X	If X: where and what
6.1	Boom tip 1	Y	✓	✓	✓	
6.2	Boom tip 2	Y	✓	✓	✓	
6.3	Block 1	N	✓	✓	✓	Gauge would not seat: corrective action as appropriate (6.2.2.4)
6.4	Block 2	Y	✓	✓	✓	
6.5						

QO / QI decision: removed now, or limited use until (date) (F.4.1)

No rejection criterion reached

Usage category and next inspection due

2026-04-17 (earlier: broken wires found, F.4.2)

Inspector name and initials (5.2.2)

J. Smith

Date

2026-04-03

Reading this example: Worst spot 120 m from the drum end: 3 random breaks in one lay length (limit 6) and 1 in one strand (limit 3), so the rope passes the broken-wire limits. Broken wires are present, so inspections should be at more frequent intervals (F.4.2). Lay length is still 190 mm, the same as the initial, so there is no lay length increase (F.4.2 h)). Rows b) and c) are N/A for this rope.

Reading this example: Block 1: the worn-sheave gauge would not seat, so it is marked N: take corrective action as appropriate (6.2.2.4).



Words used on these forms

From API RP 2D

Term	Clause	What it means
Rope	3.1.60	Wire rope, unless otherwise specified.
Rotation-resistant rope	3.1.61	Wire rope with an inner layer of strand laid one way, covered by a layer of strand laid the opposite way.
Reeving	3.1.57	A rope system where the rope travels around drums and sheaves.
Infrequent / moderate / heavy usage	5.1.2.2 to 5.1.2.4	10 h or less per month / more than 10 but less than 50 h / 50 h or more, averaged over a quarter. Not documented: should default to heavy (B.2.1.1).
QO / QI	Figure 3	Inspection done by a qualified operator / a qualified inspector.
Lay length	Annex F (with Figure F.2)	The distance along the rope in which a strand makes one complete turn around the core.
Valley break	F.2 b)	A break at the strand-to-strand contact points.
Corrugation	F.3 a)	The rope imprint in the groove surface.
Working area / non-working area	F.4.2 g)	Working area: where the rope regularly goes over a sheave. Non-working area: an area away from the sheaves.

Qualified inspector: designated by the employer, trained to API 2D-2, requalified at least every 4 years (8.3.2). The rope replacement decision is made by a qualified crane operator (QO) or qualified inspector (QI) (F.4.1).

RP 2D uses "dead end" for the tail of rope at a wedge socket or clips (F.7 c), 6.2.4.8). On this form, "dead end" in "measured at" means the far end of the rope.

Words this form uses (Crane Rope Solutions)

D1 and D2	Two diameter readings at the same point, at right angles to each other. The form uses their average.
Negative impressions	The pattern of the rope's strands pressed or worn into the groove surface of a sheave or drum.
Measured at	A point you can find again, written as the distance from the drum end or the dead end.
Winch number	The number or name of the winch this rope is on.
Winch duty	What the winch does: main hoist, auxiliary hoist, boom hoist, trolley.
OEM specified breaking force	The breaking force the crane manual asks for. Not the figure on the mill certificate.
Minimum breaking force (mill cert)	The figure on the rope's mill certificate.
Drum end / dead end	The drum end is where the rope is fixed to the drum. On this form the dead end means the other end of the rope and its end fitting (button, wedge socket, spelter socket).

