

Vacuum Pump Vane Measurement

A practical guide for replacement vane identification



MEASURE

DOCUMENT

SUBMIT

For carbon and graphite vanes used in dry-running and application-specific rotary vane pumps. Use this guide to create a clearer inquiry package from a drawing, an unused vane, or a worn sample.

BEFORE MEASURING

Confirm the pump before copying the part

The same-looking vane can use different material, geometry, wear limits, or set quantity. Identification should start with the pump and its service documentation, then use the physical vane as supporting evidence.



Safe access first

- Use trained service personnel and follow the exact pump manual.
- Stop the pump, isolate and lock the power supply against restart.
- Vent connected lines to atmospheric pressure and allow hot surfaces to cool.
- Assess process contamination and use the required PPE before handling internal parts.
- Keep removed vanes in their original order and orientation when possible.

Safety basis: pump-manufacturer maintenance guidance [4].



Capture pump identity

1

Nameplate

Photograph the manufacturer, full model, serial number, voltage and frequency fields.

2

Part reference

Record the OEM or existing supplier part number and any marking on the vane.

3

Operating mode

State dry-running, oil-lubricated, wet-running, or unknown.

4

Set details

Record the number of vanes, rotor slots, orientation and the position of each sample.

Why a worn vane is not a complete master

Wear can reduce the original height, flatten a running radius, remove a chamfer, create taper, or erase markings. A worn sample is useful, but pair it with the pump model, part number, drawing, service manual, photographs, and measurements from the full set. [1][3]

Minimum identification package

Pump nameplate

All vanes

Part markings

Pump interior

Service document

Do not infer material from color alone. A black vane may belong to different carbon, graphite, composite, polymer, or other pump-specific material families. [3]

CORE DIMENSIONS

Define L H or W and T on an annotated sketch

Terminology varies by pump manufacturer. Draw the vane in the same orientation as your photographs and label the faces used for every dimension.

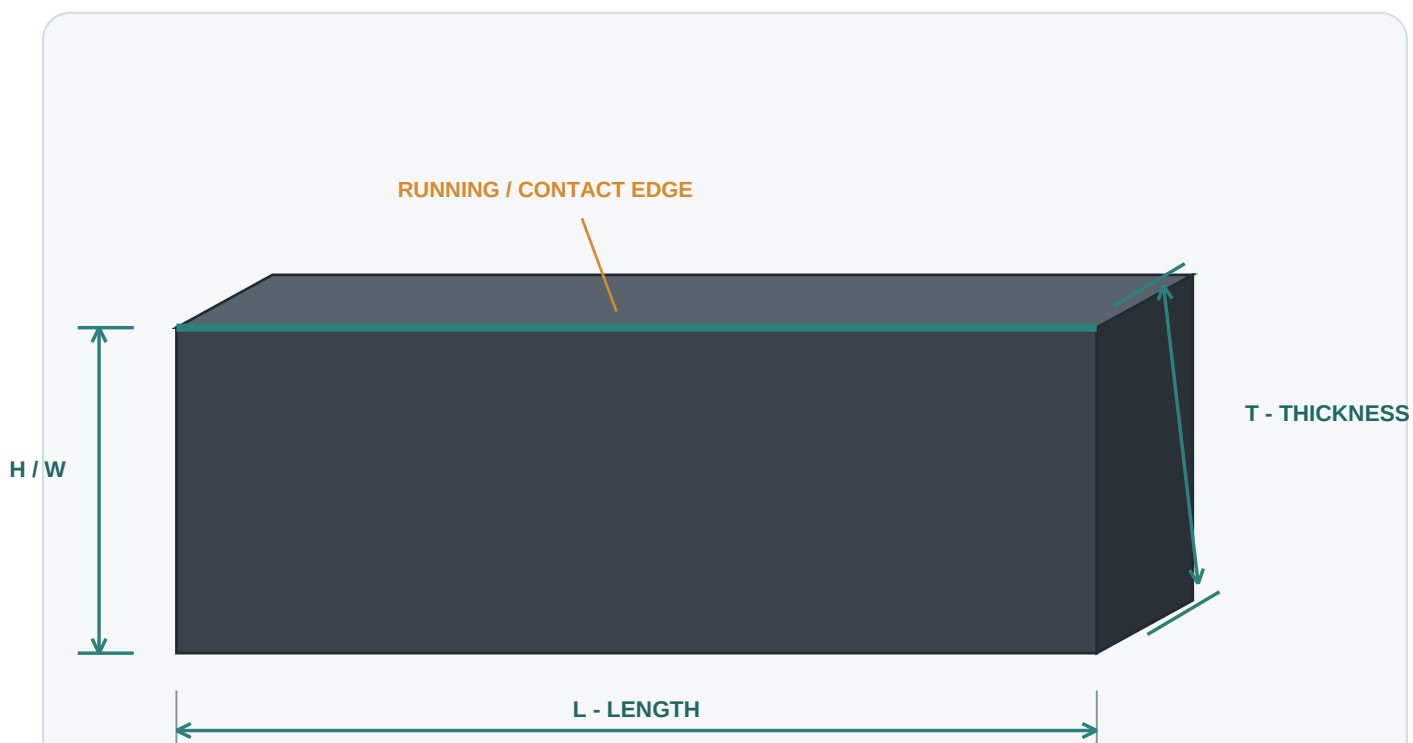


Illustration is a terminology guide, not a manufacturing drawing.

L Length

Measure the full end-to-end dimension between the two end faces. Note chips or missing corners.

END FACES

H or W Height

Measure the radial span of the vane body. On a worn vane, this may no longer be the original value.

RUNNING HEIGHT

T Thickness

Measure across the two rotor-slot faces. This dimension is critical to free movement in the slot.

SLOT-FIT FACES

Add units to every value. CARBOLVE recommends millimetres for the inquiry package; include original inch values as well if the equipment documentation is inch-based. [1][3]

MEASUREMENT SEQUENCE

Measure clean faces and retain every reading

A single number can hide taper or uneven wear. Record where each reading was taken, the instrument used, its resolution, and the sample condition.

1 Prepare

- Remove loose dust without polishing the surfaces.
- Let the part and instrument stabilise in the same room.
- Inspect measuring faces; close the tool and check zero.
- Use light, repeatable contact force - especially on graphite.

2 Measure L and H or W

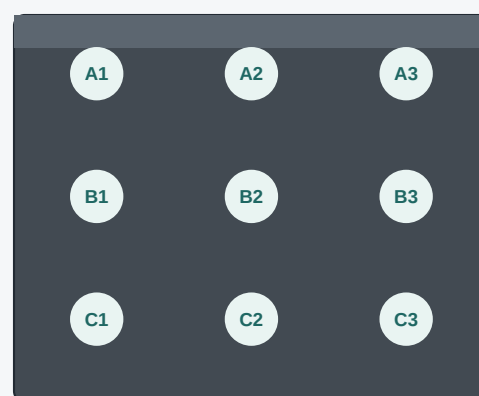
- Use the outside jaws of a suitable caliper.
- Keep the jaws square to the reference faces; do not measure across a chip.
- Take readings at both ends and the centre where the geometry allows.

3 Measure T with a micrometer

- Use flat anvils and a ratchet or friction device for consistent force.
- Measure near each end and at the centre on both sides of the vane.
- Record all readings; do not report only an average.

Suggested thickness map

Mark the same nine zones on every vane in the set.



End 1

End 2

Use an identical point map for parallel samples so measurement spread can be compared.

Dimension	Preferred tool	Where to measure	What to retain
Length L	Outside caliper	Both long edges or verified end faces	Each repeat, chip location, min and max
Height H/W	Outside caliper	Both ends and centre, if accessible	Each reading and worn-edge note
Thickness T	Outside micrometer	A/B/C zones on both slot-fit faces	All point readings and measurement map

Metrology note: repeat readings until results are stable; keep the tool aligned and use consistent, light measuring force. [5]

BEYOND L H AND T

Capture more than the outline

Record every treated edge, groove, hole, step, and directional feature. Use a close-up photograph beside an annotated sketch so orientation cannot be misread.



Square edge

Confirm whether the edge is truly square or only worn flat.



Chamfer

Record both chamfer legs, location, and which face they meet.



Bevel / angle

Record angle, land, direction, and reference face.



Running radius

Use a radius gauge or optical comparison where suitable; include a profile photo.



Groove / step

Record width, depth, distance from ends, and face orientation.



Hole / slot

Record size and centre coordinates from two datum faces.

Photograph orientation

Place the vane on a plain background with a ruler, then take: full front, full back, both end faces, both long edges, each feature close-up, and the marking. Add an arrow for pump rotation and identify the running edge when known.

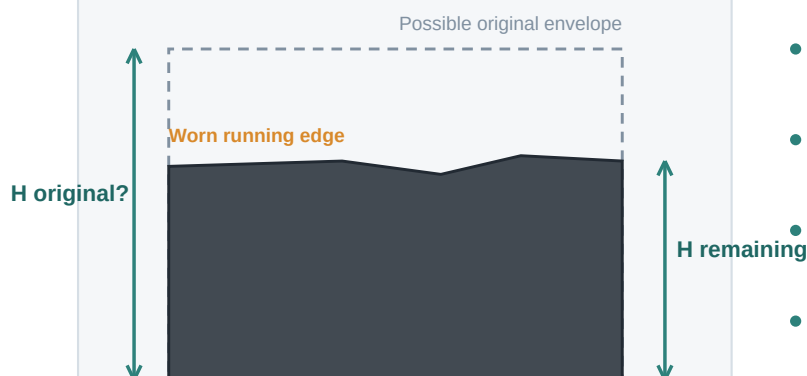
Do not add a generic chamfer or radius when the original feature is unknown. Final geometry should follow an approved drawing or verified pump specification.
[3]

DO NOT COPY THE WEAR

Recover geometry from a worn sample

A used vane is evidence of both geometry and operating history. Measure the intact features, document the damage, and use the pump data to recover what wear has removed.

Original vs remaining height



The dashed envelope is unknown unless confirmed by a drawing, an unused vane, or pump documentation.

Measure and compare the full set

- Assign each vane an ID and preserve rotor position and direction.
- Measure L, remaining H/W and the full thickness point map on every vane.
- Photograph wear polish, taper, scoring, chipping, fracture, deposits and discoloration.
- Record the largest and smallest reading - not only the mean.
- Inspect the rotor slots and chamber for deposits, scoring or damage before blaming the vane alone.

Do not infer missing geometry from one worn part.

NEW OR UNUSED

Strong physical reference

Measure all geometry, then confirm material and pump data.

WORN

Useful but incomplete

Combine with model, part number, manual, drawing and set comparison.

BROKEN

Recover intact features only

Arrange fragments for photos; do not force joints or treat total size as exact.

Wear limit is pump-model specific

Do not use a universal minimum vane height or operating-hour rule. OEM manuals can specify different wear limits even for adjacent pump models, and service intervals vary with operating conditions. Use the exact pump documentation or another verified specification. [4]

FIELD SHEET

Vacuum pump vane measurement record

Complete one sheet per pump model. Use an additional page when the vane set contains more than six samples.

A Pump identification

Manufacturer _____ Model _____

Serial no. _____ OEM part no. _____

☐ Dry-running ☐ Oil-lubricated ☐ Other / unknown Vanes per set _____

B Sample condition

☐ New / unused ☐ Partly worn ☐ Heavily worn ☐ Broken

C Core measurements mm

Vane ID	L	H / W	T min	T max	T spread	Position / note

D Geometry and special features

☐ Square edge ☐ Chamfer ☐ Bevel ☐ Radius ☐ Groove / step

Feature dimensions / orientation _____

E Operating data

RPM _____ Vacuum / pressure _____ Temperature _____

Gas / medium _____ Humidity / moisture _____

Observed problem _____

F Files attached

☐ Nameplate ☐ All vane faces ☐ Edge close-ups ☐ Drawing / manual

FROM MEASUREMENT TO ENGINEERING REVIEW

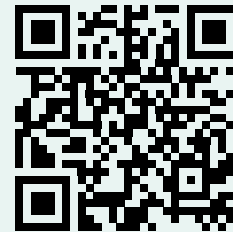
Send the complete evidence package

CARBOLVE evaluates OEM, replacement, and custom carbon vane projects from drawings, physical samples, pump models, dimensions, material requirements, and operating conditions. [1][2][3]

Recommended submission package

- Pump manufacturer, full model, serial number and nameplate photo
- OEM or existing part number and all visible markings
- Annotated sketch with L, H/W, T, units and datums
- Individual readings from every vane and the thickness point map
- Photos of every face, edge feature, wear pattern and pump interior
- Operating mode, RPM, vacuum or pressure, temperature, humidity, gas or medium, duty cycle and quantity

Open the replacement vane page



Scan to submit pump, vane, drawing, and operating information.

CARBOLVE inquiry workflow

01

Submit

Model, drawing, sample, photos

02

Review

Pump mode and operating data

03

Confirm

Geometry, material direction, tolerances

04

Validate

Quotation, sample or trial batch if agreed

Contact

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Technical note

This guide supports quotation and identification; it does not replace the pump manufacturer's maintenance instructions, wear limits, drawings, installation procedure, or safety requirements. Final vane material, geometry, tolerances, and compatibility require pump-specific confirmation.

References

[1] CARBOLVE Company Profile, 8 pages, Aug 2026. [2] CARBOLVE Carbon Vane Material Selection Guide, Version 1.0, Development Target Values. [3] CARBOLVE, Replacement Vacuum Pump Vanes, accessed 14 Sep 2026: carbolve.com/replacement-vacuum-pump-vanes/ [4] Busch Vacuum Solutions, Instruction Manual SECO SV 1003-1005 D, Safety and Maintenance sections: [official instruction manual](#). [5] Mitutoyo, Quick Guide to Precision Measuring Instruments and handheld measuring guidance: [official caliper guide](#).