# Rectangular Duct Square Elbow Turning Vane Inspection: Count, Curvature, Attachment, Alignment

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| Project | Location | Status |
|---|---|---|
| | | |

| Date | Completed by |
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| | |

## Review submittals

| No. | Done | Check / Requirement | Result | Notes / Evidence |
|---|---|---|---|---|
| 1 | ☐ | Obtain current shop drawings and submittals for the elbow and vane assembly; note required vane count and type. | | |

## Coordinate shutdown

| No. | Done | Check / Requirement | Result | Notes / Evidence |
|---|---|---|---|---|
| 2 | ☐ | Notify operations of the inspection window and affected fan/duct location. | | |

## De-energize and lockout

| No. | Done | Check / Requirement | Result | Notes / Evidence |
|---|---|---|---|---|
| 3 | ☐ | Turn off the serving fan and apply lockout/tagout per site procedures; post notification as required by site rules. | | |

## Verify zero airflow

| No. | Done | Check / Requirement | Result | Notes / Evidence |
|---|---|---|---|---|
| 4 | ☐ | Confirm airflow has stopped at the access opening before reaching inside. | | |

## Wear PPE

| No. | Done | Check / Requirement | Result | Notes / Evidence |
|---|---|---|---|---|
| 5 | ☐ | Put on cut-resistant gloves and eye protection before handling sheet metal or reaching into ductwork. | | |

## Open access

| No. | Done | Check / Requirement | Result | Notes / Evidence |
|---|---|---|---|---|
| 6 | ☐ | Open the access panel or door nearest to the square elbow; retain and secure all fasteners. | | |

## Provide lighting

| No. | Done | Check / Requirement | Result | Notes / Evidence |
|---|---|---|---|---|
| 7 | ☐ | Illuminate the elbow interior with a flashlight and use an inspection mirror or borescope for hidden areas. | | |

## Confirm vane installation

| No. | Done | Check / Requirement | Result | Notes / Evidence |
|---|---|---|---|---|
| 8 | ☐ | Verify turning vanes and rails are installed where shown on the drawings. | | |

## Count vanes

| No. | Done | Check / Requirement | Result | Notes / Evidence |
|---|---|---|---|---|
| 9 | ☐ | Count the installed vanes and record the number; compare to drawings/submittal. | | |

## Check spacing uniformity

| No. | Done | Check / Requirement | Result | Notes / Evidence |
|---|---|---|---|---|
| 10 | ☐ | Visually confirm vane spacing is consistent from throat to heel of the elbow. | | |

## Assess curvature

| No. | Done | Check / Requirement | Result | Notes / Evidence |
|---|---|---|---|---|
| 11 | ☐ | Inspect each vane for smooth, continuous curvature with no kinks, flat spots, or dents. | | |

## Verify end capture

| No. | Done | Check / Requirement | Result | Notes / Evidence |
|---|---|---|---|---|
| 12 | ☐ | Confirm each vane is fully seated in rails/retainers at both ends of the elbow. | | |

## Tug test vanes

| No. | Done | Check / Requirement | Result | Notes / Evidence |
|---|---|---|---|---|
| 13 | ☐ | Gently tug each vane and note any looseness or rattling movement in the rails. | | |

## Secure rails

| No. | Done | Check / Requirement | Result | Notes / Evidence |
|---|---|---|---|---|
| 14 | ☐ | Check rails/retainers are straight, intact, and firmly fastened to duct walls with no play. | | |

## Alignment with airflow

| No. | Done | Check / Requirement | Result | Notes / Evidence |
|---|---|---|---|---|
| 15 | ☐ | Confirm vanes align with the airflow path through the elbow without twist. | | |

## Check seating gaps

| No. | Done | Check / Requirement | Result | Notes / Evidence |
|---|---|---|---|---|
| 16 | ☐ | Look for gaps between vane ends and rails or mis-seated blades; record locations. | | |

## Edges and burrs

| No. | Done | Check / Requirement | Result | Notes / Evidence |
|---|---|---|---|---|
| 17 | ☐ | Inspect vane and rail edges for looseness, burrs, or sharp protrusions; note any hazards. | | |

## Liner condition (if present)

| No. | Done | Check / Requirement | Result | Notes / Evidence |
|---|---|---|---|---|
| 18 | ☐ | If the duct is internally lined, inspect liner near the elbow for loose edges, tears, or delamination. | | |

## Clearance

| No. | Done | Check / Requirement | Result | Notes / Evidence |
|---|---|---|---|---|
| 19 | ☐ | Verify vanes do not contact duct walls or liner except at the rails; look for rub marks or wear. | | |

## Damage and corrosion

| No. | Done | Check / Requirement | Result | Notes / Evidence |
|---|---|---|---|---|
| 20 | ☐ | Check vanes and rails for bends, dents, corrosion, or coating flaking. | | |

## Foreign material

| No. | Done | Check / Requirement | Result | Notes / Evidence |
|---|---|---|---|---|
| 21 | ☐ | Remove loose debris or foreign objects inside the elbow; account for and dispose of removed items. | | |

## Document condition

| No. | Done | Check / Requirement | Result | Notes / Evidence |
|---|---|---|---|---|
| 22 | ☐ | Photograph the vanes and record counts, alignment, defects, and their locations. | | |

## Close and restore

| No. | Done | Check / Requirement | Result | Notes / Evidence |
|---|---|---|---|---|
| 23 | ☐ | Remove tools from the duct, close and secure the access panel, remove lockout/tagout per site procedures, restore fan operation, and confirm airflow is normal. | | |

## Report issues

| No. | Done | Check / Requirement | Result | Notes / Evidence |
|---|---|---|---|---|
| 24 | ☐ | Report discrepancies and recommended corrective actions to the responsible party. | | |

**Comments / Follow-up**

## Checklist guidance

Turning vanes inside square elbows guide airflow, reduce turbulence, and help limit noise and wear. This inspection confirms the vanes are present, properly shaped, securely attached, aligned with the airflow, and free of loose edges that could rattle, shed material, or cause damage.

1. Review current drawings/submittals for the elbow and vane assembly to know the required vane count and type; plan the inspection window with operations.

2. De-energize the serving fan and apply lockout/tagout per site procedures; verify zero airflow at the access point.

3. Wear cut-resistant gloves and eye protection; open the nearest access panel and secure fasteners.

4. Illuminate the interior and use a mirror or borescope to see hidden areas of the elbow.

5. Confirm vanes and rails are installed as shown; count vanes and observe spacing, curvature, and alignment with airflow.

6. Check that each vane is fully seated in rails; gently tug for looseness; ensure rails are straight and firmly fastened.

7. Look for gaps, burrs, sharp edges, liner issues, contact marks, damage, and debris; document findings, remove debris, close and restore, and report any discrepancies.

Tick the box when complete. Record Not done or N/A in Result and note any follow-up.