



Engineering Design Portfolio

About MecHet Solutions

MecHet Solutions is a next-generation mechanical design company that delivers high-precision CAD modeling, drafting, and simulation services, helping manufacturers and product companies optimize performance, reduce cost, and accelerate production.

We partner with businesses across India and internationally, with a special focus on machinery, parts manufacturing, automation, and component design.

Our Capabilities

- **3D CAD Modeling** – Parametric, surface, and solid modeling using industry-leading tools like SolidWorks, Solid Edge, Onshape, Fusion 360, and AutoCAD.
- **2D Engineering Drawings** – Fully detailed and toleranced manufacturing drawings with GD&T compliance.
- **Design for Manufacturing (DFM)** – Optimizing parts for manufacturability with minimal iterations.
- **Simulation & Analysis** – Static stress, interference checks, FEA basics, and visual inspections like curvature/zebra striping.
- **Rapid Modifications & Revisions** – Agile design iterations, perfect for tight timelines and evolving specs.

Industries We Serve

- Precision Parts Manufacturing
- Plastic Molding and Tooling
- Automation and Fixtures
- Automotive Components
- Machinery

Countries We Serve

- Asia
- North America
- Europe
- Middle East
- South East Asia
- Australia

What Sets Us Apart

- Ultra-fast CAD turnaround times.
- Precision design approach with zero compromise on manufacturing viability.
- Flexibility to support SMEs and mid-sized MNCs without heavy overheads.
- Honest, agile, and detail-oriented collaboration.

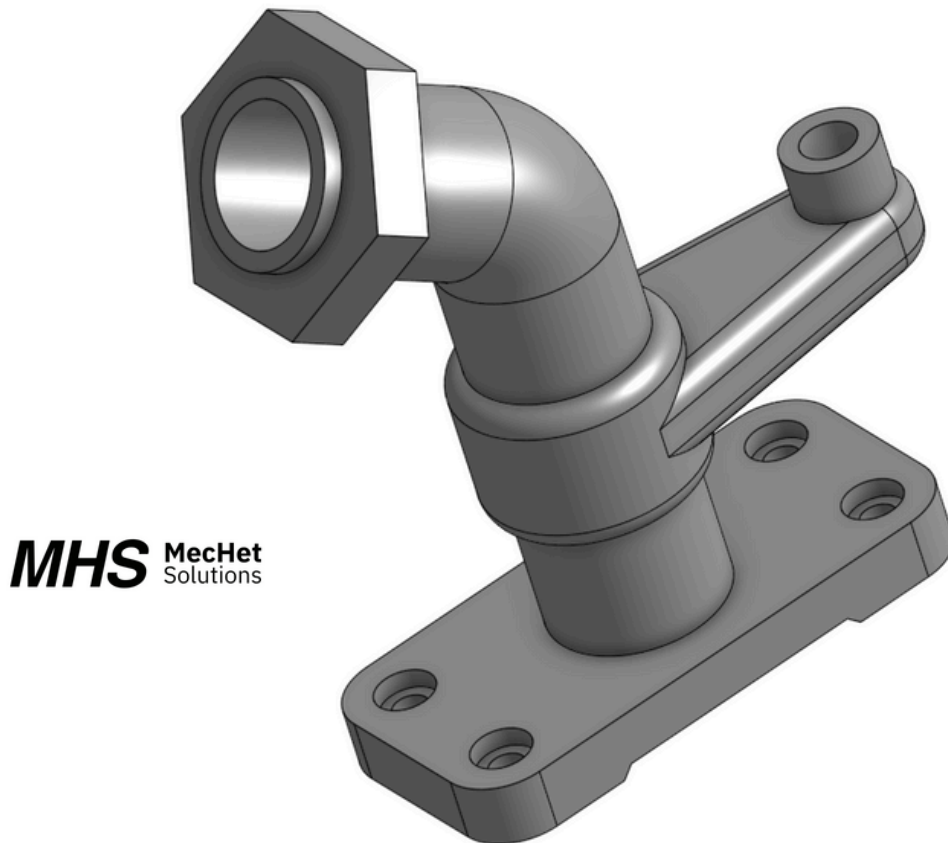
Recent Work Snapshots

Flanged Elbow Connector

Key Features:

- **Elbow Geometry (90° bend):** Used to redirect the flow of a fluid (gas or liquid) at a 90° angle.
- **Flange Base with Mounting Holes:** The base allows it to be securely bolted onto a surface, machine, or pipe system.
- **Hexagonal End with Internal Thread:** This suggests it's designed to connect to a threaded pipe or fitting.
- **Support Arm (possibly for sensor or attachment):** The smaller protruding arm may serve structural, mounting, or sensor attachment purposes.

Material: Stainless Steel 304 (Polished Finish)



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FLANGED ELBOW CONNECTOR MODELED IN ONSHAPE

Zebra Stripe Analysis

It is used to determine the continuity of the surfaces and shows how smoothly light flows across adjacent surfaces.



ZEBRA STRIPE ANALYSIS OF FLANGED ELBOW CONNECTOR

Zebra Stripe Analysis with 35 stripe count, and the result shows a good surface continuity.

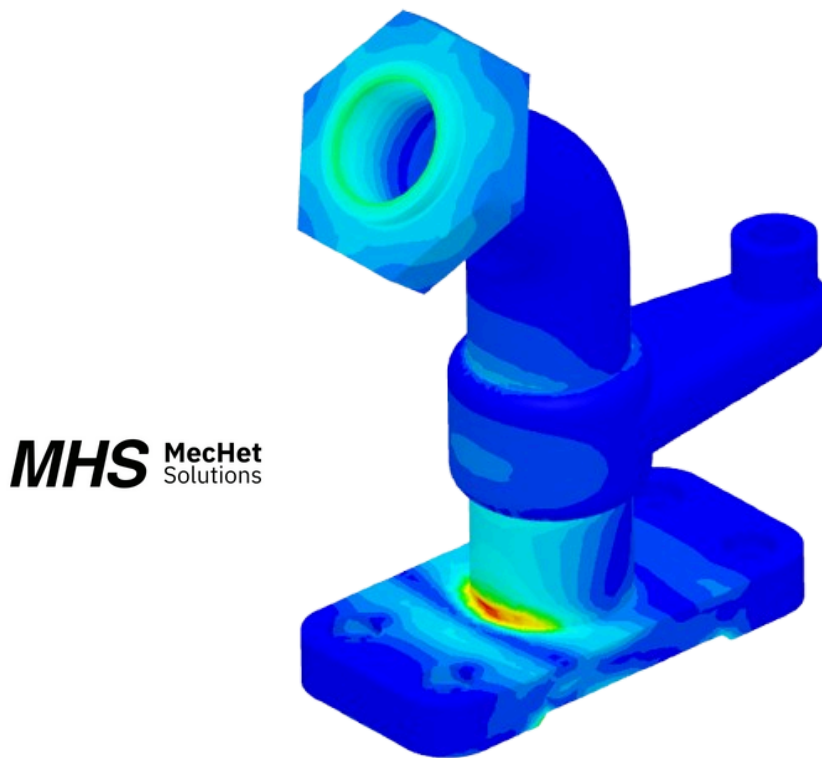
✅ Surface Continuity Verified Using Zebra Analysis

Stripe Count: **35**

Quality: G1–G2 Surface Continuity (Tangent to Curvature Continuous)

Tool: Onshape

Von Mises Stress Analysis



ZEBRA STRIPE ANALYSIS OF FLANGED ELBOW CONNECTOR

Stress Concentration Zone:

- The highest stress is visible (in red/yellow) at the fillet junction between the vertical pipe and the mounting flange, which is a classic stress riser location due to:
 - Load transfer from pipe to base.
 - Geometry transition.
 - Possible fixed constraint or bolt load applied there.

Overall Safety:

Assuming the part is made from **Stainless Steel 304**, which has a yield strength of approx. **215 MPa**, the max stress of ~31.2 MPa is well below the yield point → **Safe Design**.

Static Structural Simulation – **Von Mises Stress**

Material: **Stainless Steel 304**

Max Stress: **~31.2 MPa**

Yield Strength: **215 MPa (SS304)**

Factor of Safety: **6.8**

Simulation Performed in: **SimScale** integrated with **Onshape**

Observations: Highest stress occurs at the vertical-to-base fillet due to fixed support. Design remains within **safe** limits.

RENDERS

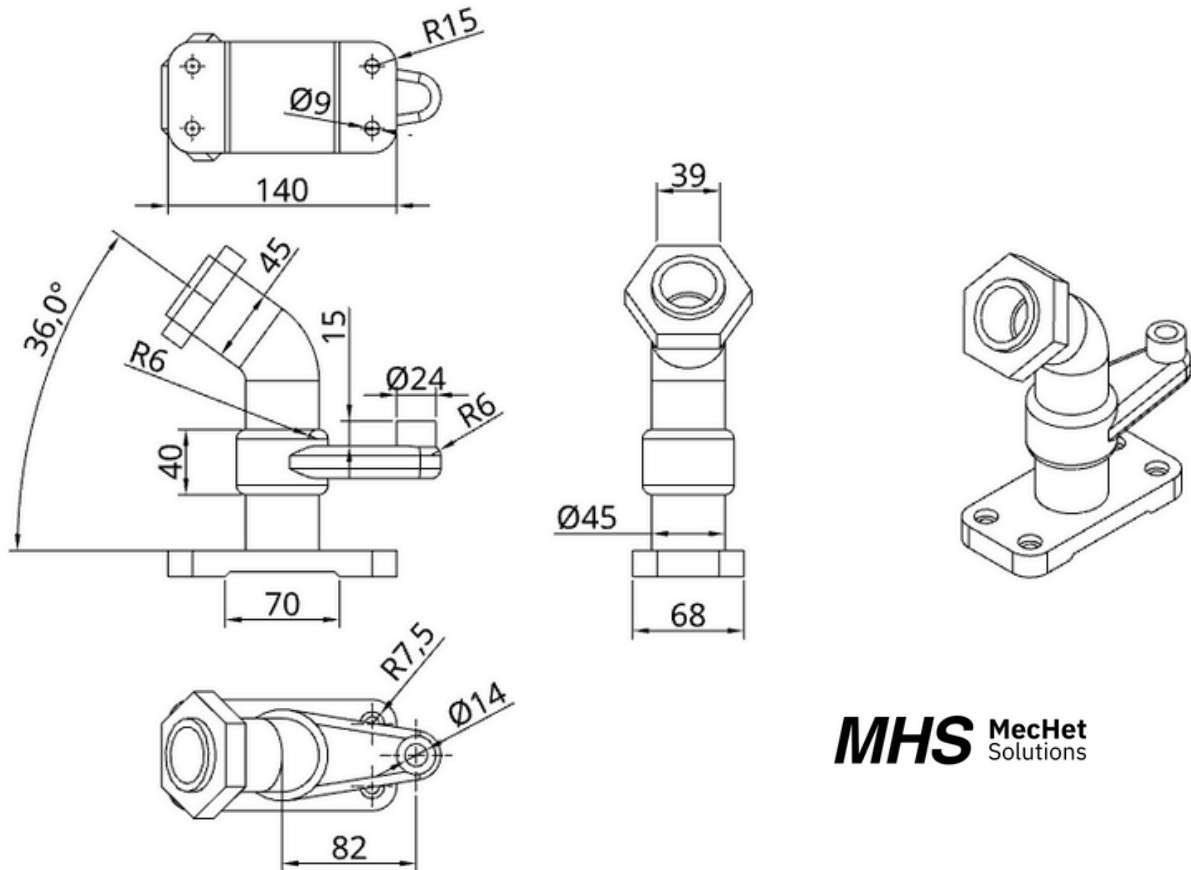




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DRAWINGS



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- All essential orthographic views are present: Top, Front, Right, Isometric.
- Key dimensions (like $\varnothing 9$, $\varnothing 14$, $\varnothing 24$, $\varnothing 45$, R6, R7.5, R15) are correctly marked.
- Angles and radii are defined well (45°, R6, etc.).
- Hole positions and feature lengths (e.g., 140, 70, 68, 82 mm) are properly dimensioned.

◆ **Why Work With Us?**

- Fast Turnaround: We deliver results rapidly.
- Engineering Accuracy: Every project goes through validation checkpoints
- Global Compatibility: ISO, ASME, DIN, JIS drafting standards
- Personalized Support: Email us directly at info@mechetsolutions.com



GALLERY OF RECENT PROJECTS



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FLANGED ELBOW CONNECTOR

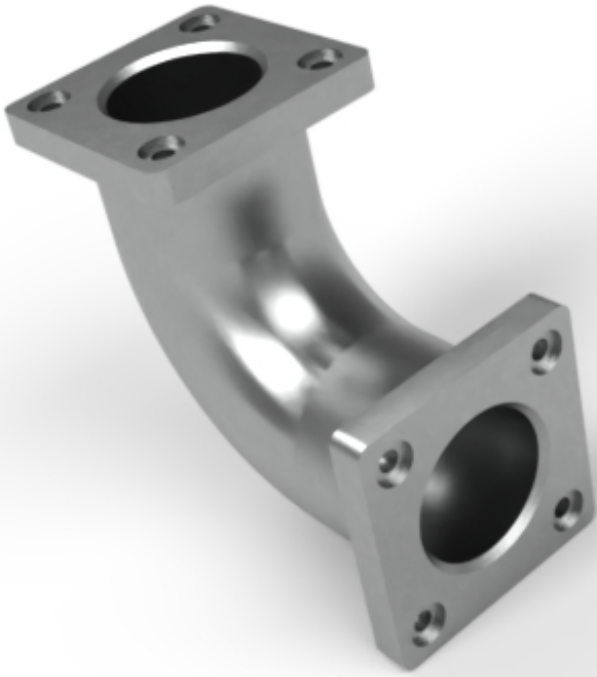


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ERGONOMIC WALKING STICK HANDLE

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FLANGED PIPE ELBOW



BELLA VITA CEO PERFUME BOTTLE



Get in Touch

We're ready to assist with overflow design work, special prototyping projects, or long-term collaborations. To discuss potential engagements, reach us at:

 **info@mechetsolutions.com**

 **www.mechetsolutions.com**

LinkedIn

<https://www.linkedin.com/company/mechet-solutions/>

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