

Case Study

Tangential Flow Filtration (TFF) System Design and Engineering

TANDEMLOOP DESIGN WORKS

MAIL: info@tandemloop.in
www.tandemloop.in

TANDEMLOOP

DESCRIPTION



In biochemistry and the development and production of biomolecules, one of the key techniques employed from the research stage to the production stage is tangential flow filtration.

Tangential flow filtration (TFF), also known as cross-flow filtration, passes a fluid tangentially across the surface of a porous filter or membrane. Whatever is larger than the pore size of the membrane remains in the flow path and whatever is smaller migrates across the membrane. This mode of filtration ensures a higher yield and longer filter or membrane life over **direct-flow filtration**, which forces fluid perpendicularly through a filtration medium. **TFF** is used for many different filtration applications including the following:

- Purification and concentration of biopharmaceuticals and diagnostic particles
- Desalting solutions
- Point-of-use water filtration
- Cold sterilization of culture media
- Protein purification and concentration
- Virus removal and concentration
- Lysate clarification
- Bioreactor perfusion
- Whole-cell diafiltration

WHAT DO WE DO?



The TFF system design process begins by understanding the **P&ID** received from the pre-sales team, wherein our in-house design team tries and understand the system requirement provided in the **P&ID** and come up with the best possible way of building the system, as there are various possibilities of building a similar system based on each person's perspective.

Once the team finalizes a particular design that they have come up with, they start building the **3D model** for the same by considering manufacturing and economic aspects in mind so that they can provide the best and cost-effective ways of manufacturing that system to our customers, which would help them to **reduce the cost and resources** they would have to spend in manufacturing that system in the later stage.

Creating the 3D model helps to have a better visual of the system which in turn helps to eradicate any errors in the conceptual stage rather, which otherwise would have **bigger consequences** in the later stage i.e., the detailed designing stage or the manufacturing stage. Further, the 3D model of the system also helps to decide on almost accurate overall dimensions of the system which will be finally manufactured, once **finalized by the customers**.

Upon getting the **final confirmation** from the customer for the conceptual layout submitted, our team starts working on the **detailed design** of the system by referring to the same P&ID which was used in the **conceptual layout** stage or maybe a revised one, if there were any further changes in the later stage of the conceptual layout.

During this **detailed engineering stage**, our team meticulously works on the project making sure that no detail is being missed out and that all engineering and manufacturing aspects are being considered and are aligned with **ASME BPE** practices. Also during this detailed engineering stage, once a certain percentage of the project is completed, we have an internal review with the client so as to make sure that even they are aligned and aware of the project's progress.

Finally, once the **3D assembly model** is completed and finalized from the clients end, our team starts working on the **2D drawings** required for manufacturing that system, which includes preparing (including BOM for individual drawings)

- **General Assembly Drawings**
- **Chassis Drawings**
- **Piping Weld log Drawings**
- **Block Drawings**
- **Pressure Vessel Drawings**, if any.

Upon completion of the drafting activity, the drawings undergo **6 eye review phase**, wherein all the drawings are reviewed by the internal team members as well as the client just to make sure that there are no details being missed in the drawings while preparing them. Further, if there are certain details being missed while drafting the drawings we track them in our **checklist** and inform the team regarding the same so as to make sure that such mistakes are not repeated in future projects. Once the drawings are reviewed and finalized, the drawings are released for manufacturing. This marks the end of the whole design process involved in designing the **TFF system**.

Further, we also help our client with certain **standardization activities** which involve creating **Standard 3D models** of parts and components and preparing **2D drawings** for the same.

HOW CAN WE HELP YOU BUILD YOUR FUTURE DESIGNS?

The Issue with working alone

- Let's cut to the chase, everybody is busy with many **responsibilities**. Design is one of them.
- There is a **lot of effort** required both from the internal design team and the vendor team.
- As a **Design Head**, this is a nightmare as there is no transparency between the vendor and the internal team.

How can we help?

- Having been in the industry for so many years, we have assisted a number of customers with their design process from the ground up.
- In order to make sure you never encounter any issues with **Design Deliverables**, we use the tool in parallel with our design team and technical team.

WHY CHOOSE TANDEMLOOP DESIGN WORKS

- **High-Quality Output** is generated in Powerful systems capable of handling any workload.
- All systems are loaded with **Genuine Software** tools to provide complete protection and stability to the files.
- **Data Backup Automation** allows us to seamlessly work with the absolute safety and integrity of the files.
- All data is encrypted using secure **256-bit encryption** and state-of-the-art Data Security.
- A Team of **Highly skilled** and **self-motivated** individuals works together to obtain a seamless faster delivery.
- Our prices are **highly competitive** for the type of service we provide.