



857 Lincoln Avenue  
Bohemia, New York 11716  
U.S.A.

Toll Free: 1-800-253-7140  
Phone: 631-563-8300  
Fax: 631-563-8378

e-mail: sales@steri.com  
web: [www.steri.com](http://www.steri.com)



## ZWAG Filter

Totally enclosed, single-plate Nutsche filters for pressure filtration and vacuum drying...



100%  
Re-Slurrying

100%  
Cake  
Washing

100%  
Cake  
Drying

Solids Concentration up to 70%. Sizes up to 12m<sup>2</sup>

### ZWAG<sup>®</sup> Nutsche Filters

**Superior design, superlative performance and professional support.**

ZWAG is a family of totally enclosed, single-plate Nutsche filters for pressure filtration and vacuum drying. With integral heating and drying, multi-functional ZWAG filters are compact and versatile for manufacturing, pilot and laboratory applications.

ZWAG filters have been proven effective across a broad range of processes under widely differing and extremely demanding operating conditions. They can meet the most stringent emissions standards, and will operate reliably and safely even in the most aggressive environments. You'll find ZWAG filters to be productive in pharmaceutical, biotechnology, petrochemical and many specialty chemical processes.

Manufactured in the United States of America by Steri Technologies, ZWAG filters combine superior design with a program of total support that makes filtration easy from every perspective.



0.3m<sup>2</sup> ZWAG Filter



0.25m<sup>2</sup> ZWAG Filter with Containment System



3.0m<sup>2</sup> ZWAG Filter



0.6m<sup>2</sup> ZWAG Filter



Electro-Polished Perforated Plate



Spray Balls for Cake Washing & CIP



8" [200mm] Swing Side Discharge



Heated Agitator with Bellows



857 Lincoln Avenue  
Bohemia, New York 11716  
U.S.A.

Toll Free: 1-800-253-7140  
Phone: 631-563-8300  
Fax: 631-563-8378

e-mail: sales@steri.com  
web: [www.steri.com](http://www.steri.com)



## ZWAG Filter / Applications

This technology has an extensive record of reliable performance across a broad range of applications...

### The Exact Solution

With ZWAG filters by Steri Technologies, you can depend on cost-effective performance from the most efficient manufacturer. These filters meet ASME or other industry standards and incorporate important functional enhancements designed by Steri engineers, each with a quarter century of hands on ZWAG Filter experience. With hundreds of systems in place worldwide this technology has an extensive record of reliable performance across a broad range of applications:

- Pharmaceutical
- Petrochemical
- Food industry applications requiring FDA approval
- Fuel and oil additive filtration
- Hazardous materials filtration
- Precious metal and other catalyst recovery
- High solid content: up to 70%

**Users appreciate the ZWAG filter's compact design for performance excellence and simple, safe, reliable operation**

At a glance you will notice the superior design of ZWAG filters. Unlike most other filters, it's a single, compact skid mounted unit with an uncluttered exterior designed with the operator in mind. Look beneath the clean exterior; you'll see design excellence throughout the system that delivers a top quality filtrate efficiently, reliably and safely.

Built by Steri to the most stringent quality standards, ZWAG filters can stand up to the rigorous demands of operation with proven reliability in hundreds of applications around the world.

### Safety Standards

When ordered with the optional gas-tight side discharge housing and customized seals, ZWAG filters can meet EPA standard for toxic vapor emissions. If standards are raised, modifications can be incorporated with relative ease and low cost.

Operators can safely perform all functions, including filter removal and replacement. All unnecessary handling and its associated risks have been designed out of the ZWAG filter with the integrated, fully automated vacuum drying system.





857 Lincoln Avenue  
Bohemia, New York 11716  
U.S.A.

Toll Free: 1-800-253-7140  
Phone: 631-563-8300  
Fax: 631-563-8378

e-mail: sales@steri.com  
web: [www.steri.com](http://www.steri.com)



## ZWAG Filter / Design & Options

Numerous standard options and knowledgeable decision support from process experts...

### Design & Options

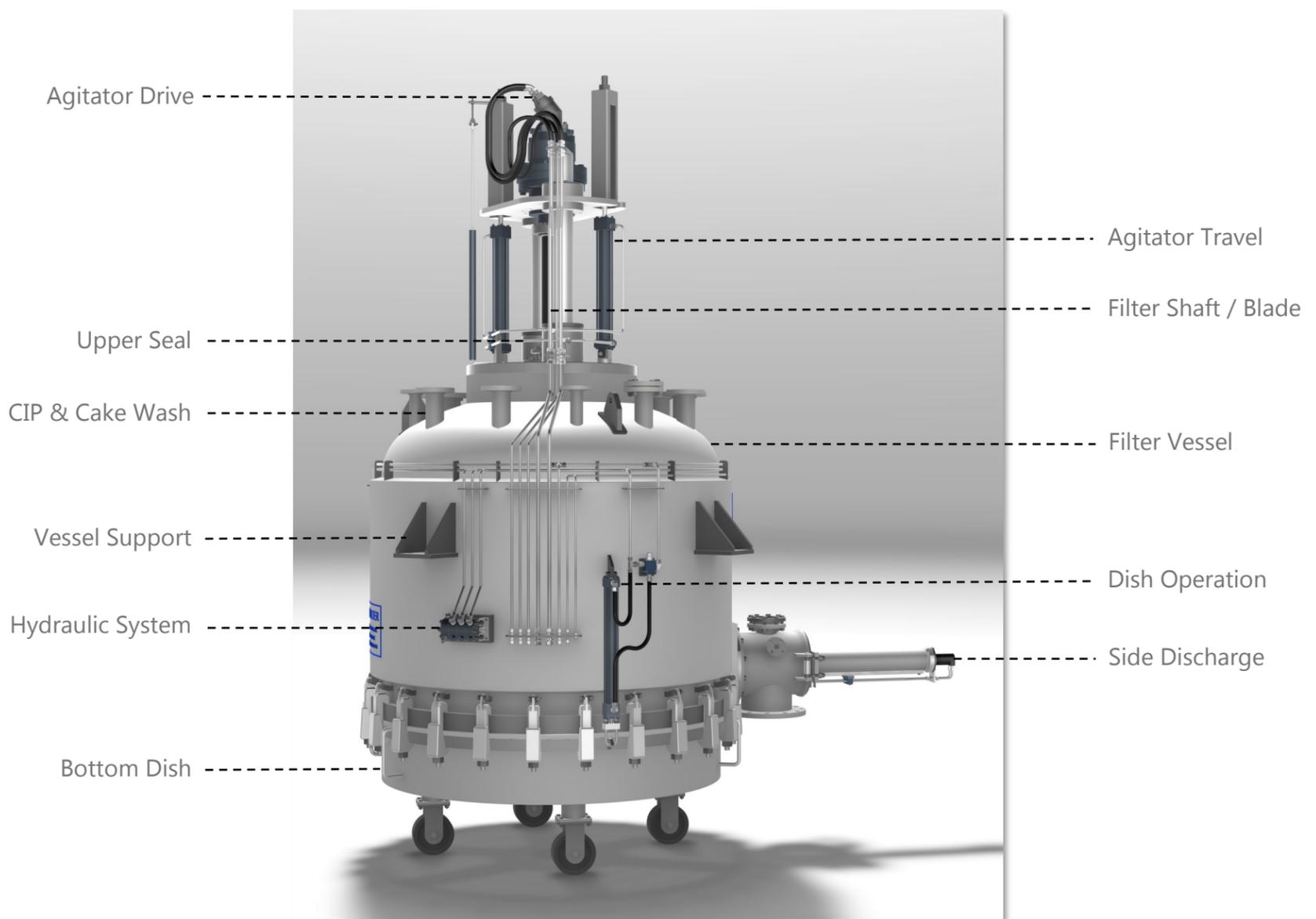
Each ZWAG consists of four main parts, the vessel, the agitator assembly, the bottom plate, and the side discharge port.

The largest part of the ZWAG filter is the vessel, which is cylindrical in form with an integral spherical top. The head closes the top of the vessel and supports the agitator assembly.

The agitator has a vertically oriented shaft, with horizontal blades mounted at the bottom. The agitator is motor driven and can rotate in forward and reverse. In addition, the agitator can move vertically, driven by hydraulic cylinders. The movement of the agitator allows for cake smoothing, re-slurrying, and cake discharge.

The bottom plate supports the filter screen. The side discharge employs a sealed plunger port which can be manually or automatically operated.

### Anatomy of a ZWAG Filter





857 Lincoln Avenue  
Bohemia, New York 11716  
U.S.A.

Toll Free: 1-800-253-7140  
Phone: 631-563-8300  
Fax: 631-563-8378

e-mail: sales@steri.com  
web: [www.steri.com](http://www.steri.com)



# ZWAG Filter / Standard Sizes

Customer-configured to your specifications.

Engineered for efficient, reliable & safe operation...

## Comprehensive Options

A comprehensive set of options and Steri's applications experience assure your precise requirements are met quickly and easily.

With numerous standard options and knowledgeable decision support from process experts, your ZWAG filter can be easily configured to meet your specifications. What's more, you'll benefit from the flow of design enhancements Steri has been bringing on line each year.

Various options are offered for all ZWAG filter systems. Steri offers a complete range of off the shelf options. Coupled with the engineering applications know-how, we can configure your filtration system to your exact specifications. Choosing from a selection of standard components, that have been proven effective many times over, is a sure way to bring a customized system on line quickly and without problems.

## Capacities

Your ZWAG filter is customer-configured to your specifications from standard components that have been proven effective many times over. It's the surest way to bring a new system on-line quickly and without problems. With a complete range of off-the-shelf options plus engineering applications know how, ZWAG by Steri can meet your special needs.

Size	Surface Area	Vessel Diameter	Nominal Working Volume*	Total Volume*	Solid Volume	Agitator Stroke
m <sup>2</sup>	m <sup>2</sup>	mm	liters	liters	liters	mm
0.25	0.27	600	150	189	75	300
0.50	0.49	800	300	352	150	300
0.75	0.76	1,000	450	572	225	300
1.0	1.13	1,200	1,000	1,190	500	500
1.6	1.77	1,500	1,600	1,930	800	500
2.0	2.26	1,700	2,000	2,510	1,000	500
3.0	3.14	2,000	3,000	3,680	1,500	500
4.0	4.15	2,300	4,000	5,030	2,000	500
5.0	5.31	2,600	5,000	6,430	2,500	500
6.0	6.15	2,800	6,000	7,800	3,000	500
8.0	8.04	3,200	8,000	10,630	4,000	500
10	10.17	3,600	10,000	14,020	5,000	500
12.0	12.56	4,000	12,000	18,010	6,000	500

\*Vessel height can be extended to increase batch volume.



0.2m<sup>2</sup> ZWAG Filter



0.3m<sup>2</sup> ZWAG Filter



2.0m<sup>2</sup> ZWAG Filter



3.0m<sup>2</sup> ZWAG Filter



4.0m<sup>2</sup> ZWAG Filter



6.0m<sup>2</sup> ZWAG Filter



857 Lincoln Avenue  
Bohemia, New York 11716  
U.S.A.

Toll Free: 1-800-253-7140  
Phone: 631-563-8300  
Fax: 631-563-8378

e-mail: sales@steri.com  
web: [www.steri.com](http://www.steri.com)



## ZWAG Filter / Operation

Beneficial for slurries up to 70%.

Built-in vacuum drying reduces product handling...

### Theory of Operation

ZWAG Nutsche-style filters feature a single filter plate located at the bottom of the vessel. The single plate allows build-up of a large amount of cake. This is beneficial for slurries that contain up to 70% solids.

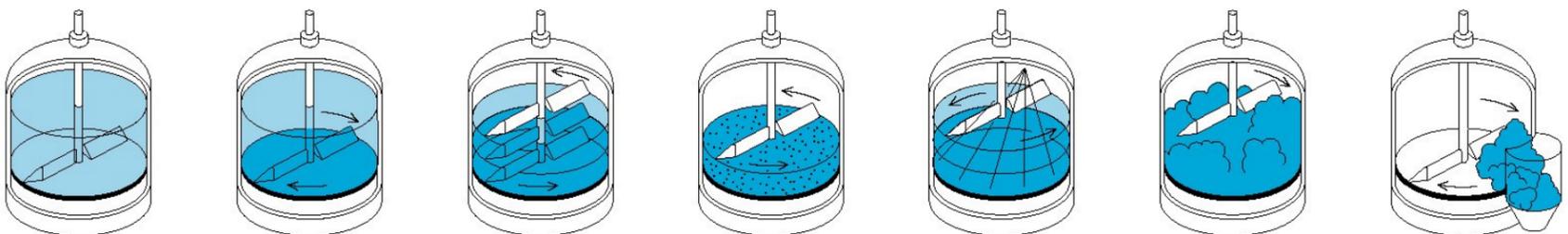
During filtration, externally applied pressure forces the slurry downwards through the filter plate and the filtrate exits through a nozzle centered under the filter plate. Most filters rely, to varying extents, on the solids left behind on the filter surface to achieve maximum effectiveness, essentially using the solids, commonly called cake, to trap more solids. The thick cake that builds-up in a Nutsche filter can crack. Slurry will take the path of least resistance and flow through the cracks and not the cake, thus compromising filtration.

ZWAG filters use a motor driven, rotating agitator inside the vessel to continuously smooth the cake and keep it evenly distributed. Simultaneously, hydraulically driven actuators move the agitator vertically to follow the growth of the cake.

Once the filtration process is complete, the cake can be washed and re-slurried by the agitator to achieve greater cake purity.

ZWAG filters offer the flexibility of vacuum and/or hot gas drying to achieve the correct cake consistency.

After the cake has been dried the side discharge valve is opened. The agitator rotation is reversed to push the cake out through the open valve.



#### Step-By-Step for Quality Performance

Sized for your production batch, your ZWAG is never a bottleneck.

#### Stirring for Slow-Filtering Products

After filling, continuous stirring just above the filter plate reduces filtration time.

#### Uniformity for Quick-Filtering Products

The cake is layered with evenly distributed particles by progressively raising the agitator blades.

#### Press for Quality

The agitator smoothes down the cake to close cracks and create a uniformly permeable structure.

#### Wash for Quality

Liquid can be sprayed evenly over the cake for thorough diffusion washing. For greater purity, the cake can be reslurried.

#### Uniform Drying

Solids can be kept moving over the heated bottom for speedy, complete drying.

#### Top Down Discharge

The agitator blade scrapes the cake through the side door from top to bottom.

### Efficiency

Simple concepts, well-orchestrated, enhance performance:

- Active agitation promotes homogeneous cake and speeds filtration
- Washing and re-slurrying eliminates impurities
- Single filter plate speeds cleaning and/or change-over for successive batches of different products and eliminates cross contamination
- Built-in vacuum drying reduces product handling

Its compact design makes one person operation easy and safe. Engineered and built to the most exacting standards, the ZWAG filter is a reliable, low maintenance workhorse.



857 Lincoln Avenue  
Bohemia, New York 11716  
U.S.A.

Toll Free: 1-800-253-7140  
Phone: 631-563-8300  
Fax: 631-563-8378

e-mail: sales@steri.com  
web: [www.steri.com](http://www.steri.com)



## ZWAG Rental Systems

Simple to install in virtually any environment.  
Glowing reports in its ease of operation...

### Think Steri for Rentals

Use one of our filters on a rental basis to experience first hand, filtration made easy. You'll see how simple it is to install a Steri filter in virtually any environment. You'll notice and appreciate its compact design. You'll get glowing reports in its ease of operation and purity of output. Steri maintains an inventory of ZWAG filter rentals. ZWAG filter dryers are available up to 0.5m<sup>2</sup> size and Hastelloy construction. The smaller ZWAG filters are skid mounted for fast, easy installation. Put them to use for laboratory work, pilot processes and short term production runs. A rental unit can be cost-effective and up and running in just a few days.

### Think Steri for Lab Testing

#### Liquid-Solids Separation and Filtration Testing in Our Lab

Steri now offers testing of your product in our laboratory. For decades now, Steri Technologies has been a leading manufacturer of ZWAG Nutsche technology.

Steri has several small scale filters in our lab that enable us to test various filter media and filter-aids to determine the most efficient filtration process for your product.



#### Think Steri for Lab Filters

In addition to portable pilot and production models, Steri offers a convenient 0.01m<sup>2</sup> filter to permit you to quickly test filtering feasibility and filter media. We would be delighted to bring it to your plant for a consultation, or provide it on a rental basis

#### Try and Buy

All of our rental filters are automatically included in our TRY-and-BUY program. The Steri "Try and Buy" program provides credit for a portion of the rental fee toward the purchase of a full-scale filtration system. And when you compare value and price – made even more cost effective by the special terms available through Try and Buy – you'll select Steri for ZWAG filtration made easy.

#### Liquid-Solids Separation and Filtration Testing in your Facility Using our Rental Units

Steri has several small-scale filters available as rental units. Scaled-down, self-contained, skid-mounted versions of our ZWAG line of Nutsche filters can be rented for in-plant pilot runs or testing. These small-scale rental filters enable you to test various filter media and filter-aids to determine the most efficient filtration process for your product..





857 Lincoln Avenue  
Bohemia, New York 11716  
U.S.A.

Toll Free: 1-800-253-7140  
Phone: 631-563-8300  
Fax: 631-563-8378

E-mail: sales@steri.com  
Web: www.steri.com



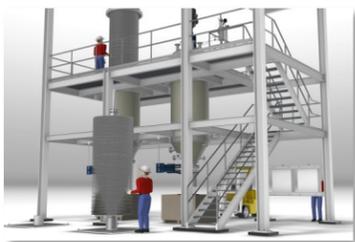
# Turn-Key Systems

Steri plans, designs and manufactures complete automated filtration installations...

## Turn-Key Filtration Systems

**Steri Technologies has the engineering expertise to design and fabricate completely self-contained, fully automated, turn-key filtration and process systems.**

For decades now, the FUNDA filter has been used all over the world to separate solid matter from liquids. Steri plans, designs and manufactures FUNDA filters as separate units, as filter skids and as complete filtration installations - complete with process engineering and corresponding process guarantees.



R-80m<sup>2</sup> FUNDA Filtration Unit

Sometimes a stand-alone filter does not meet the process requirements, on-site integration capabilities, or scheduling constraints. Sometimes only a complete turn-key filtration system will meet the challenge.



R-20m<sup>2</sup> FUNDA Filtration Skid

Steri Technologies has the experience of designing filtration systems to exacting customer specifications. Our engineers review the overall process sequence to recommend the most effective means of adding a filtration step.



A-15m<sup>2</sup> FUNDA Skid with Pre-Coat, Body Feed Tank and Bag Loading Station

## Custom Process Systems

Steri designs and builds custom process systems that combine multiple process steps into one skid mounted assembly. Any process steps may be included such as wet & dry material injection, mixing, weighing, filtration, heating, drying and any others that might be needed. We've manufactured various types of stand-alone skidded systems for uses such as industrial process heaters, chilled water filtration, water desalination, laboratory preparation and more...



HVAC Side Stream Filtration

The resulting filtration or process system seamlessly integrates with your overall infrastructure. Our modular systems feature factory level manufacturing and quality control. All custom skids are fully tested before leaving our facility.



Brackish Water Desalination Skid



Cutting / Cooling Oil Mixing Plant



Laboratory Prep Skids



Heating / Cooling Skids



Brackish Water Desalination Plant



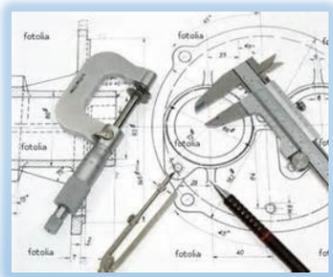
Cutting / Cooling Oil Mixing Plant



857 Lincoln Avenue  
Bohemia, New York 11716  
U.S.A.

Toll Free: 1-800-253-7140  
Phone: 631-563-8300  
Fax: 631-563-8378

e-mail: sales@steri.com  
web: [www.steri.com](http://www.steri.com)



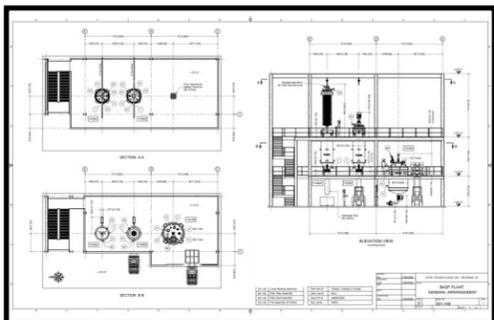
## In-House Engineering

Experienced engineering team that provides complete design support from concept to installation...

### Filter Design, Integration & Process Design Support

#### Filter Design

Steri has an experienced engineering team that provides complete design support from concept to installation. Starting right from the proposal stage, we create a clear picture of your filtration system and its integration into your facility using 3D CAD software. As the design evolves the 3D model is continuously updated. Approval drawings and bills of materials are ready for quick turn-around minimizing delays in ordering material. At completion of the project the 3D model is fully updated to reflect the as-built configuration and included in the complete documentation package.



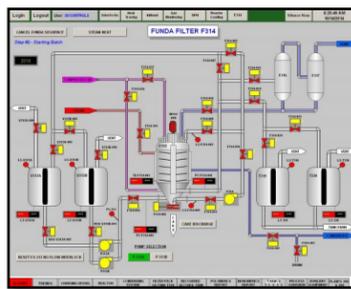
#### Integration

Process sequencing maps out the overall design of the filter and how it will fit into your process. Steri works with your engineering team to design an integration plan. The plan identifies any upgrades or modifications that may be required to your existing infrastructure.

#### Process Design Support

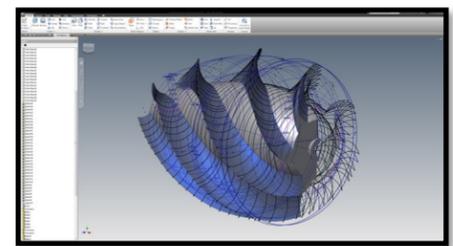
Steri offers process revitalization support for legacy installations. If you have an older Steri filter but do not feel that you are getting the best possible performance we can help. We have a knowledge base of thousands of systems installed world-wide.

Over the course of time, system sequences tend to grow away from the original design intent. A thorough system analysis by one of our engineers can net you performance improvements and cost reductions. As a result of our analysis we then recommend instrumentation upgrades and safety improvements. The instrumentation also allows the process to be automated, reducing down-time. The vent system can be evaluated along with the drying technique. By simplifying the vent routing and incorporating the latest drying techniques the overall cake drying time could be reduced. Steri can review the piping plan uncovering exceeding long piping runs, eliminating contamination between batches of different products. Once all of these recommendations have been implemented, Steri then establishes baseline operating points including characterized pressure increases as filter loading increased. The data can then be used in conjunction with the instrumentation to optimize the automation program. Sequence review by Steri and the resulting process changes along with automation will increase safety, decrease waste and save money.



#### Process Design

The key to producing a quality product using Steri Filters is process integration. Steri engineering works with you early-on to create a complete filtration process sequence. Part of the sequence development includes an evaluation of your overall system that results in recommended upgrades to your system. Giving you the best performance possible from your new Steri filter. The sequence, which is presented in HMI screenshots, includes all the steps required such as filling, pre-coat, filtration, washing, re-slurrying, drying, discharge and clean-in-place.



#### CAD-CAM Machining

Our engineers design every component in 3D right from the start. The software handles complex shapes and standard flanges equally. Once the design is complete the files are sent directly to our CAM software for error free CNC machining. All performed in-house to ensure complete quality control.





857 Lincoln Avenue  
Bohemia, New York 11716  
U.S.A.

Toll Free: 1-800-253-7140  
Phone: 631-563-8300  
Fax: 631-563-8378

e-mail: sales@steri.com  
web: [www.steri.com](http://www.steri.com)



# In-House Manufacturing

Our modern manufacturing facility is equipped with the latest equipment...

## Machining, ASME Fabrication & Testing

Steri Technologies offers machining and ASME pressure vessel fabrication services to a variety of industries. Our modern manufacturing facility is equipped with the latest manufacturing equipment including CNC milling, lathe, Robotic welding and water jet machines.

We are an ASME and National Board certified company. Our employees take pride in their company and meet your requests with a "can do" attitude. We offer a variety of services:



CNC Lathe



Mill Lathe



Robotic Welding



Skid Fabrication



System Testing



CIP Testing



Waterjet Cutting



ASME Fabrication



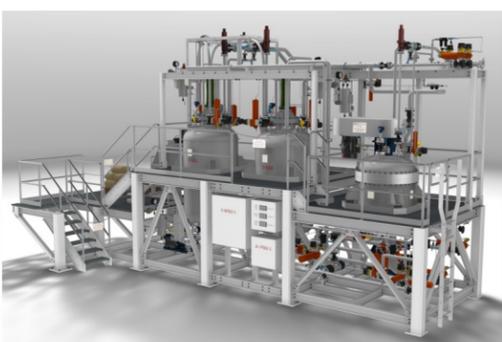
Mechanical Polishing



Laboratory Testing

## From Vision to Reality

3D Model Developed with Client



Final Fabricated Skid

3D Model Developed with Client



Final Fabricated Skid

3D Model Developed with Client



Final Fabricated Skid



857 Lincoln Avenue  
Bohemia, New York 11716  
U.S.A.

Toll Free: 1-800-253-7140  
Phone: 631-563-8300  
Fax: 631-563-8378

e-mail: sales@steri.com  
web: [www.steri.com](http://www.steri.com)



# Start-Up & Support

Your Steri system is serviced by the people who manufacture it...

## Commissioning, Start-Up & Site Training

Your filter system can be up and running in just a few hours. Steri provides the level of service that meets the needs of your project. We offer complete system design and installation services to seamlessly integrate our equipment into your process facility. In the design phase Steri will provide all the necessary recommendations for pipe routing and valve placement so that you get the best possible performance from our filter systems. Steri can provide experienced on-site installation support, coordinating the trades such as crane operations, structural steel fabrication, concrete installation, piping and wiring. This complete level of support applies to all Steri products from complete skidded filtration systems to stand-alone filters.



Installation Supervision



FUNDA Filter Installation



Filter Commissioning

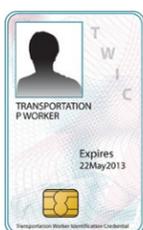
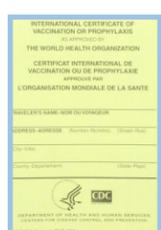


On-Site Training

Steri's service does not end with installation. Our trained technicians will be present during start-up and commissioning to maximize the performance of the filter within your overall process. Once the filter has been commissioned Steri will provide complete on-site training to all operators so that your Steri filter continues to provide maximum service for years to come.

## Technical Support

Steri service technicians are available whenever you need. They have been fully trained on confined space protocols, hold the widely recognized Transportation Worker Identification Credential (TWIC®), and can be dispatched to anywhere in the world.





857 Lincoln Avenue  
Bohemia, New York 11716  
U.S.A.

Toll Free: 1-800-253-7140  
Phone: 631-563-8300  
Fax: 631-563-8378

e-mail: [sales@steri.com](mailto:sales@steri.com)  
web: [www.steri.com](http://www.steri.com)

# Total Filtration Solution

Activated Carbon Removal  
Antibiotics Separation  
Sterile Environment Processes  
Fuel and Oil Additive Filtration  
Photo-Chemicals Filtration  
Gold Precipitate Recovery  
Hazardous Materials Filtration  
Radioactive Waste Filtration  
Machine Oil Regeneration

Catalyst Recovery  
Resin Filtration  
Pharmaceutical  
Petrochemical  
Food Industry  
Plasticizer Filtration  
Antioxidant Filtration  
Precious Metal Recovery  
Polyol Filtration



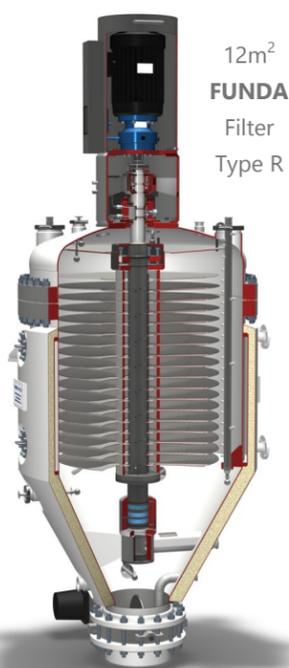
## Steri has the **Right** solution for your **Filtration** application

For decades now, Steri Technologies has been delivering reliable filtration equipment to every continent around the world. Superior designs of **FUNDA** pressure leaf filters, **ZWAG** Nutsche filters, Steri **CANDLE** filters technologies and many more...

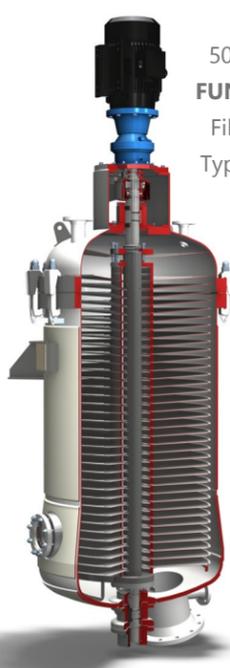
### FUNDA® Filter

### ZWAG® Filter

### CANDLE Filter



12m<sup>2</sup>  
**FUNDA**  
Filter  
Type R



50m<sup>2</sup>  
**FUNDA**  
Filter  
Type A



2m<sup>2</sup>  
**ZWAG**  
Nutsche  
Filter



5m<sup>2</sup>  
Steri  
**CANDLE**  
Filter

**FUNDA type R,**  
for dry cake discharge.  
0.1m<sup>2</sup> to 100m<sup>2</sup>

**FUNDA type A,**  
for slurry cake discharge.  
0.1m<sup>2</sup> to 100m<sup>2</sup>

**ZWAG, superior design, superlative performance and professional support.**  
0.1m<sup>2</sup> to 12m<sup>2</sup>

**Steri CANDLE filters, low solid filtration.**  
0.1m<sup>2</sup> to 60m<sup>2</sup>

**FUNDA®** filters are compact, enclosed, self-cleaning, multi-plate filters available with integrated heating and drying for manufacturing, pilot and laboratory applications. With more than 6,000 systems in place worldwide, and hundreds in North America, this technology has an extensive track record of reliable performances across a broad range of applications.

**ZWAG®** is a family of totally enclosed, single-plate Nutsche filters for pressure filtration and vacuum drying. With integral heating and drying, multi-functional ZWAG filters are compact and versatile for manufacturing, pilot and laboratory applications.

Steri **CANDLE** filters are enclosed, candle shaped filter elements arranged vertically inside a pressure vessel. The filter cake is formed on the outside of the candle.