

Metso:Outotec

# Life Cycle Services for Filters

For maximum uptime and productivity



# Life Cycle Services for filters

Achieving optimal filtration results require filters to be in excellent mechanical condition and balanced with optimized maintenance and operations. Life Cycle Services (LCS) can help improve overall filter reliability, performance and safety.

## Main challenges operating filters in the plant

When operating filters, you may encounter familiar challenges. These can range from experiencing shorter wear component life-times, having unexpected equipment failures, to experiencing high variation in the slurry feed content. Finding technical expertise at the right moment can also be challenging. These problems can lead to:

- Excessive maintenance and spare part costs
- Failing to reach production targets
- Suboptimal product quality

## Choosing Life Cycle Services for filters

Metso Outotec LCS for filters programs can help you overcome these challenges. Based on many years of experience in designing, building, delivering and maintaining filters, we know how to get the most from your filtration assets throughout their entire life cycle.

By choosing Metso Outotec LCS for filters, you can simplify your maintenance, improve your filter reliability, minimize downtime, and maximize filter life while achieving the highest productivity for your equipment.

With our LCS programs, we drive value adding service solutions depending on your needs. Our programs integrate service elements into simple, comprehensive, long-term agreements targeting the high overall equipment efficiency of the filter. Core service elements in our LCS packages are spare parts and repairs, maintenance and reliability, connected equipment and process optimization. All the programs cover options to optimize your costs and cash-flows.

## Four LCS programs

We offer four different levels of service programs. Each package adds additional features, and no matter how basic or how complex your needs are, our programs can be customized to help you meet your objectives.

**LCS programs drive long term performance optimization and continuous improvement.**

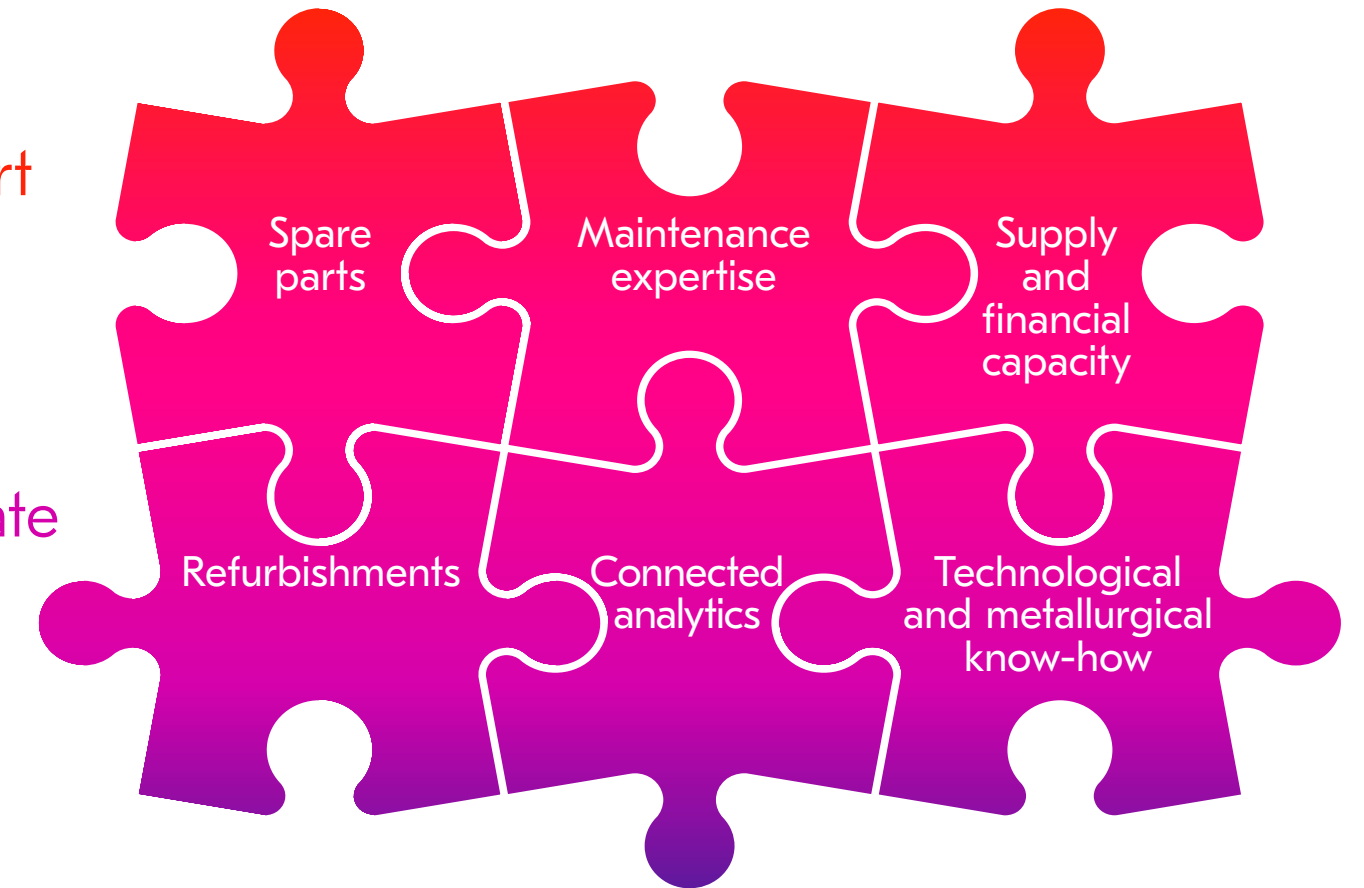
# Four Life Cycle Services programs

1 Inspections and technical support

2 Maintenance and reliability

3 Rotable filter plate management

4 Process optimization



## Core outcomes:

- Maximized filter reliability and production
- Highest end-product quality
- Lowest sustainable costs and quick return on investment

## Other benefits:

- Minimum spare parts inventories for the customer
- Steady cash-flow and volume price incentives

## Program 1: Inspections and technical support

Having everything perfectly in place for a successful major maintenance event for your filter can be a challenge. Our Inspections and technical support LCS program ensures that equipment condition is well monitored, and correct maintenance actions and overhauls are efficiently executed for highest availability.

### Improved performance

Our certified OEM experts take care of planning the overhaul, providing the filter inspections and technical support as well as supervising the maintenance. Predefined spare parts kits are supplied and changed out during the service. Technical resources for wear and spare parts replacement labor are also provided when required. Metso Outotec recommends connecting the filter to its global remote monitoring platform (Connected analytics) to further improve its performance and provide performance guarantees as part of the agreement.

### Continuous improvement

The program is scheduled annually with renewal options to continuously improve the following production period as well as the next overhaul event. This way, Metso Outotec can provide precise improvement suggestions for better performance and reduced costs. The package simplifies your internal work and administration processes as it is delivered under one agreement. Spare parts availability always remains at optimal levels as the supplied parts kits ensure you don't deplete your regular spares inventory.



### Core outcome:

- High filter availability with fewer unexpected surprises

### Other benefits:

- High quality and completion of major maintenance activities and overhauls
- Less unexpected downtime due to failures
- Optimized parts availability



## Program 2: Maintenance and reliability

High filtration performance, limited time for maintenance and cost pressures require a comprehensive maintenance strategy. Often, preventive maintenance activities focus on major areas like the filter plates, with less consideration for other critical systems in the filter. Problems with the filter are not always visible until they become serious, often resulting in expensive damage to the equipment. The larger the filter is, the more time is required to identify and solve the issue.

Metso Outotec's Maintenance and reliability LCS program covers all the functional systems of the filter. This program spreads the complete maintenance activities across shorter, more manageable events on critical systems, ensuring that all important components and materials are covered. These shorter and efficient service events help reduce the need for longer planned shutdowns throughout the year, allowing for maximum use of the filters.



### Comprehensive asset management

The program is adjusted according to the equipment production targets, available maintenance time and wear part lifetimes. It includes initial set-up of the correct program, execution support, complete spare part kits as well as continuous improvement using reliability engineering, data analysis and technical support. An agreed maintenance schedule allows Metso Outotec to plan supervision and proactive spare parts supply which comprises the core content of the agreement.

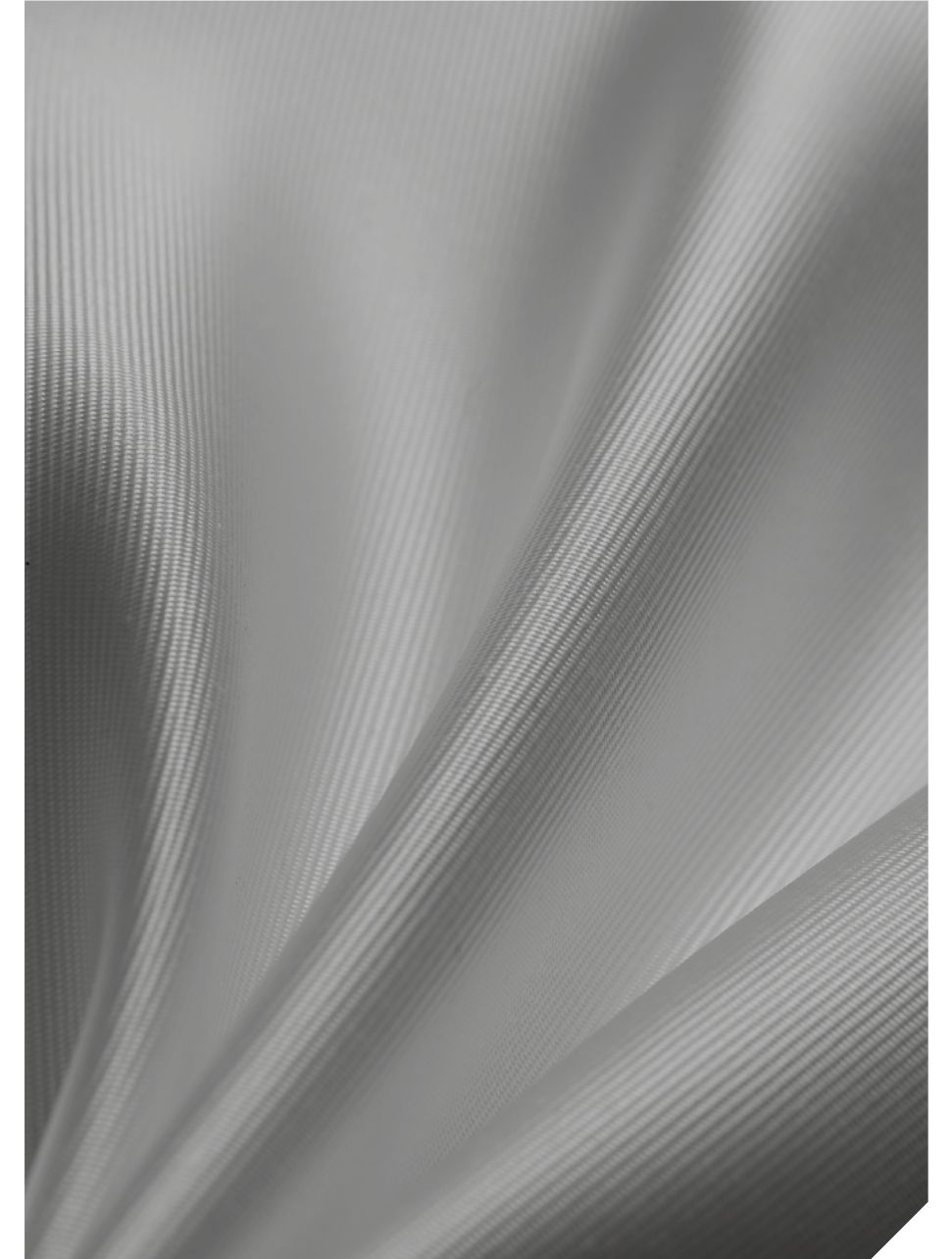
Using our Connected analytics platform, we can foresee potential performance issues within the systems and quickly act to provide the right solution. Root cause analysis on failures and component lifetimes help to optimize the maintenance plan and provides sustainable savings to the customer.

#### Core outcome:

- Maximized equipment reliability

#### Other benefits:

- Simple and time optimized preventive maintenance and parts schedules for all core systems of the filter
- Optimized maintenance resourcing, inventory, and supply chain



## Program 3: Rotable filter plate management program

Filter plates are the heart of PF, FFP and VPA filters models and must be kept clean and in great condition to ensure good filtration results and a long lifetime for the equipment. Their filter plates include multiple wear parts that require periodic change outs, depending on filter utilization and specific operating practices. Changing the wear parts in a filter plate is time consuming. Having new or reconditioned filter plates available to be exchanged during maintenance reduces equipment downtime significantly.

Metso Outotec offers cost effective program options to manage the OEM filter plates exchange and refurbishment for different filter models under our LCS Rotable filter plate management program. Depending on the filter model, Metso Outotec will provide new stand-by plates, supply the repair labor, spare parts kits, installation as well as wear rate monitoring of the components to define improvement opportunities. Specifically, for PF-filters, a rotatable plate pack refurbishment program is available and includes a complete stand-by plate pack as part of the agreement.



### Reduced total cost of maintenance

When plate packs reach their scheduled change out times, they are removed from the filter and immediately replaced by the standby unit. The removed plate pack is then refurbished to like-new condition in our Metso Outotec service centers, with an OEM guarantee and placed back into the standby rotation at your plant, ready for the next change out. This allows multiple plate rotations over a given period, avoiding the need to invest in new expensive metal components. This program ensures minimized maintenance times and the lowest sustainable cost amongst the available options for our customers.

For Ceramic (CC) filters, Metso Outotec additionally offers long-term supply agreements and lifetime guarantees for ceramic plates that cannot be repaired.

### Core outcome:

- Filter plate exchange with minimal downtime and lowest maintenance lifecycle costs

### Other benefits:

- Complete solution, reducing customers administrative burden
- Minimum spare and capital parts inventory



## Program 4: Process Optimization

Having a reliable filter and high process stability are the keys to maximizing filter performance. With the constant variation of slurry feed influencing your filtration processes, it can be challenging to manually maintain a filter within its optimal operational range to reach targeted production and end product moisture levels.

### Optimal parameters for the process

Metso Outotec Process Optimization package will help you maximize productivity and the energy efficiency of your filters by addressing your specific plant challenges. Using our process and technology expertise gained from thousands of process tests and filter installations, we can identify the optimal operating parameters for your filters as well as help with the selection of the most suitable filter cloth.

### Automated filtration processes

Metso Outotec LCS contracts offer a systematic way to measure and identify improvements for any process condition. Making use of proprietary Design of Experiments (DoE) tools, we carry out plant trials to find improvement areas.

In addition to our expert services, we have developed Advanced Process Control (APC) solutions for thickening and filtration processes that can significantly raise your equipment's productivity and end product quality (moisture), while reducing filtration cycle times and energy consumption. Installations across the world have shown improved filtration plant capacity up to 30% after implementing Metso Outotec APC solutions for dewatering plants.

Thickener and Filter Optimizers stabilize the effect of upstream process variations, provide tools for improved process control, and reduces the need for manual intervention.

### Core outcome:

- Maximized filtration rates
- Lowest end-product moisture

### Other benefits:

- Optimized power and reagent consumption
- Stable filter operation under any process condition
- Safer and higher autonomy of filter operation





## Case study: Jindal Steel and Power Limited (JSPL), New Delhi, India

New Delhi based Jindal Steel and Power Ltd. (JSPL), benefiting from the huge steel demand in the country, has established itself as one of the leading players in the industry. To meet increasing demand, JSPL was looking for partners to complement their strengths and provide world class equipment and support to deliver excellent results.

To lower energy consumption and to increase plant availability, JSPL decided to install a wet grinding circuit with filtration for its second pellet plant. JSPL awarded Metso Outotec a 3-year LCS contract for the operation and maintenance of eight Metso Outotec VPA filters which has been renewed every year post the completion of the initial 3 year contract.

With LCS for filters, JSPL was assured of enhanced availability, higher production and predictive and preventive maintenance to enhance machine life. The VPA's are performing as per JSPL's expectations and are also providing significant cost benefits. Under the LCS contract, JSPL and Metso Outotec agreed on a clear target, i.e. consistent VPA filters availability of more than 90%, which has been delivered ever since.



## Case study: Titanium Dioxide production in Western Europe.

Operating in Western Europe, a major producer of Titanium Dioxide ( $TiO_2$ , a pigment used in paints and plastics) has had a Metso Outotec LCS Inspections and technical support contract in place for over 12 years for its filters. This has allowed the producer to shift its focus from maintenance to ambitious production and efficiency targets.

With the LCS contract in place, high levels of filter availability have been reached and maintained. Since the initial contract, the producer has also added an additional five Metso Outotec filters (FP models) at the plant in two streams, which are now covered by the LCS agreement.

The high level of machine availability was reached thanks to the combination of OEM expertise in terms of maintenance and filtration process knowledge, combined with a culture of transparency and cooperation with the producer's key service teams at the site. Metso Outotec has also provided process support for filter setup which has added additional value in terms of improved final product quality.

# Financial and payment options

## Upgrades and CAPEX deferred payments

Deferral plans let you make payments for investments such as upgrades or new capital equipment over a longer time period, rather than the date of purchase. This gives you financial flexibility to quickly acquire the solution you need.

## Metso Outotec Inventory Solutions (MOI)

Having Metso Outotec inventory on site allows you to reduce your working capital while maintaining high parts availability to keep your equipment running.

## Fixed monthly billing

We mutually predetermine your payment schedules to allow better predictability. Once we've defined the scope of your LCS for filters program (in terms of services, spares, filter cloths, etc.), we'll set up an amortization schedule, laying out invoice amounts on a monthly basis.

## Performance/KPI based billing

KPI targets can be linked to fixed fee payments, with Metso Outotec receiving additional payment for exceeding targets and vice versa if targets are not attained. Multiple KPI's can be considered, typically being equipment availability, component life-times, end-product quality and safety indicators.

## Cost per ton billing

Cost per ton payment plans take cost spikes out of the picture and charge you based on what you produce in a given month. This allows you to better predict costs and cash flows and ensures that interests are perfectly aligned to maximize production.



# LCS Programs for Metso Outotec filters

	Program 1 Inspections and technical support	Program 2 Maintenance and reliability	Program 3 Rotable filter plate management	Program 4 Process optimization
<b>Spare and wear parts</b>				
Parts inventory management and optimization	●	●	●	●
Maintenance specific spare parts kits	●	●	●	●
<b>Assesments and monitoring</b>				
Equipment inspections	●	●	●	●
Connected analytics	●	●	●	●
Maintenance and reliability engineering		●	●	●
<b>Maintenance management</b>				
Maintenance supervision	●	●	●	●
Technical support	●	●	●	●
Maintenance planning and scheduling		●	●	●
Maintenance execution		●	●	●
Maintenance management system (CMMS)		Recommended	Recommended	Recommended
Major repairs/refurbishments			●	●
<b>Operation and process optimization</b>				
Process advisory	Recommended	Recommended	Recommended	●
Filter optimizer - APC				●
Thickener optimizer - APC				●
<b>Financing options</b>				
Upgrades & CAPEX deferred payments	●	●	●	●
Metso Outotec Inventory Solution (MOI)	●	●	●	●
<b>Payment options</b>				
Fixed monthly billing	●	●	●	●
Performance/KPI based billing	Recommended	●	●	●
Cost per ton billing	Recommended	●	●	●



