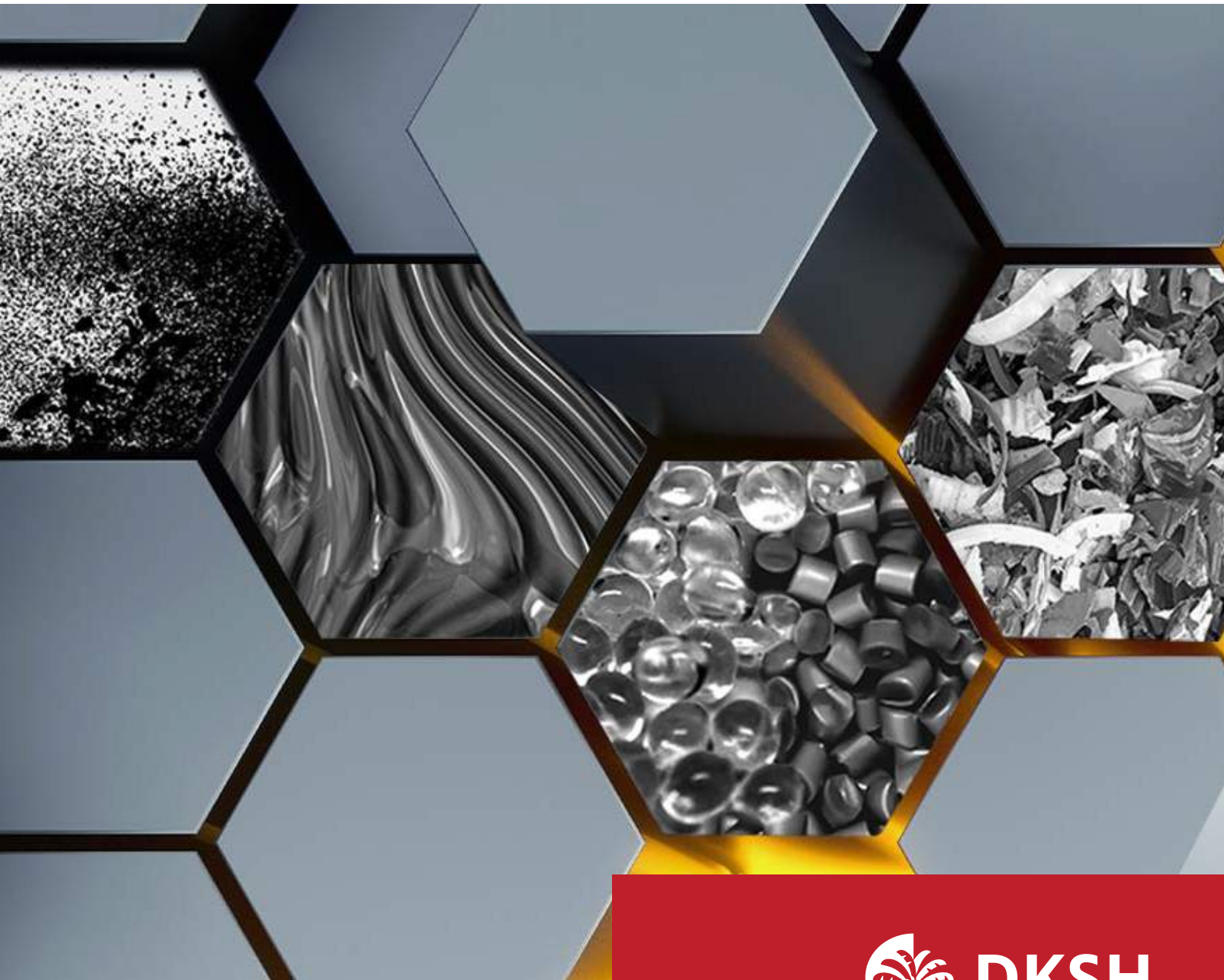


Business Unit Technology

**Business Line Packaging, Printing & Converting**

**Your Expert for Pump and Filtration System**

**MAAG**



Delivering Growth – in Asia and Beyond.

## Business Unit Technology

### About Business Unit Technology

DKSH Technology is a leading distributor of capital investment goods and analytical instruments. We provide high-quality products, innovative solutions, and a full range of services to ensure business growth for our customers in Asia Pacific.

As a total solutions provider and system integrator, we serve our customers as a one-stop-shop and provide customized technology solutions.

Our services cover the entire product life cycle including installation and commissioning, final acceptance testing, production start-up support, training, maintenance, repair, spare parts, and consumables supply as well as trade-ins.

You can rely on excellence in after-sales services from our dedicated team with deep technical expertise. We ensure unparalleled after-sales services to solve your problem timely and maximize productivity.

We operate as a trusted link between suppliers from Asia, Europe or America, and customers in Asia. You can count on us to provide the right solution for your business success.

### Business Line Packaging, Printing & Converting

Continuous innovation and new technologies are transforming the print and packaging sectors in Asia. We offer advanced industrial solutions in the packaging, printing, and converting industries. With our rich experience in this area, we collaborate closely with our partners to develop tailored solutions that help our customers achieve higher efficiency and performance reliability.

With a focus on sustainable flexible packaging solutions, we satisfy our customers' environmental commitments with real economic benefits.

By partnering with us, you get access to innovative technology and best-in-class products in the industry

We supply leading machines and solutions to pharmaceutical, food & beverages, cosmetic, and personal care sectors.

### Why Work With DKSH?

- You will make well-informed decisions with all the information you need up front provided by DKSH
- You have access to a portfolio of reputable brands from leading companies that meet your demanding requirements
- Our employees with strong technical knowledge and application engineering capabilities assisting you throughout the purchasing process
- Your purchase is backed-up by our excellent after-sales services with fast response times
- A reliable and trustworthy partner deeply rooted in the local communities with track record and financial stability

### Our broad range of solutions for various industries

With our profound market knowledge we are best positioned to serve our customers according to their needs. We provide products and services to the following industries across Indonesia.



Chemical



Petrochemical



Polymer



Plastic & Rubber



Oil & Gas



Marine



Food and beverages



Pharmaceuticals

# Our Solution

## About MAAG Group



MAAG is a pioneer and technology leader in the development and manufacturing of customized gear pumps, filters, and screen changers, including system solutions. Its experience can be traced to the founding of the company in 1910. The first MAAG gear pumps were patented in Switzerland as early as the 1920s. The intensive knowledge transfer between the fields of competence forms the basis for the technological innovation of MAAG Group, allowing them to meet diverse customer requirements in the polymer, chemical, petrochemical, pharmaceutical, and food industries today and in the future.

## Gear Pump Applications

Gear pumps transport a wide variety of media in industrial production processes in general, in the chemical industry as well as in the pharmaceutical and food industries. The matching gear pumps and pump systems can be found in MAAG's wide range of products by plant manufacturers and producers and processors of plastics.

### 1. Polymer Production Pumps

#### Product Type



**thermorex® TRO/TRP**

#### Transfer pump for oligomers and prepolymers

Polymer processes and polymer applications require polymer transfer pumps which will constantly and reliably feed oligomers and prepolymers through the system. The liquid polymer pump design is highly suitable for low viscosity. Thanks to thermorex® TRP and TRO, reactors no longer have to be pressurized. The good efficiency and long service life increase the efficiency of your production plant with polymer transfer pumps from MAAG.

Key features:

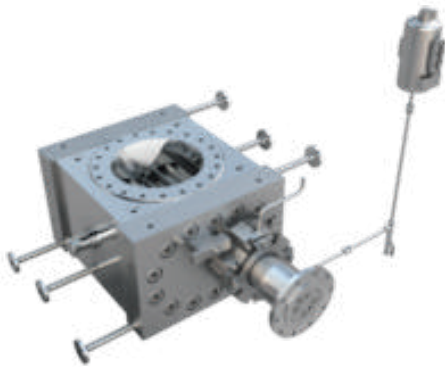
- Excellent fill behavior due to optimized inlet geometries
- High overall efficiency, minimized friction thanks to pioneering gear and bearing technology
- Low pulsation pumping even at high differential pressures



**thermorex® TR/TB/TP**

#### Booster pump for the polymer industry

Polymer processes require booster pumps and polymer metering pumps that gently process both high and low viscosity plastic melt through the polymer processing system. Specially designed low-compression teeth allow the thermorex® transfer, booster or metering gear pumps of the x<sup>6</sup> class to achieve both high pressure and low shear. The plastic melt is conveyed with a constant, precise flow even at high discharge pressures — also for low viscosity products like prepolymers, where previous polymer pump generations reached their limits in industrial applications. Additionally, their high efficiency and long service life will enhance the capacity of any given production plant.



**vacorex<sup>®</sup> VX**

### Extraction pump for the polymer industry

MAAG introduces the vacorex<sup>®</sup> x<sup>6</sup> class polymer extraction gear pump. vacorex<sup>6</sup> ideally fulfills modern polymer production processes which require polymer pumps that can discharge at high pressure despite very low fill level and high vacuum conditions in the reactor/devolatilization vessel. MAAG vacorex<sup>6</sup> polymer extraction pumps process a wide range of different polymer grades without affecting their quality. Reliable, requiring little maintenance, and robust enough to withstand the rigors of years of operation, the vacorex<sup>6</sup> polymer gear pump is the ideal solution for such applications.



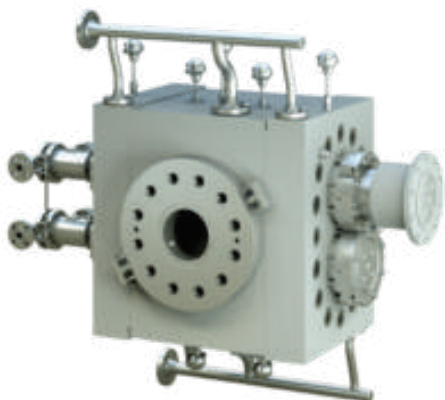
**viscorex<sup>®</sup> VR**

### Extraction pump for the polymer industry

Polymer processes in the polymer industry require units that gently discharge low and high-viscosity plastic melts from reactors and degassing equipment. The MAAG polymer extraction pump systems and viscorex<sup>®</sup> transfer gear pumps feature the excellent fill behaviour and short residence times that make them the ideal solution for such polymer applications. Their high efficiency and long service life will enhance the capacity and availability of your polymer production line. viscorex<sup>®</sup> transfer gear pumps efficiently convey plastic melts with a constant, precise flow.

Key features:

- Excellent fill behavior due to optimized inlet geometries
- Gentle treatment of polymer melts thanks to special gear teeth with low squeezing power
- High overall efficiency and hence minimized friction thanks to pioneering gear and bearing technology.



**polyrex<sup>®</sup> PR**

### Pressure increasing pump for the polyolefin industry

Processes in the manufacture of polyolefins require high-pressure gear pumps which build up pressure for the units after the compounder. The new performance driven geometry of polyrex<sup>®</sup> x<sup>6</sup> class results in high throughput rates at high flow rates and low shear stress. polyrex<sup>6</sup> can convey low viscosity polymers where earlier pump generations failed. Thanks to increased pump performance, the specific conveying capacity is 50% higher compared to same housing size pumps of older generations. For debottlenecking existing plants, MAAG offers alternative housing designs with matching interfaces to older pump generations.

Key features:

- Processing of highly diverse polymer melts with wide viscosity range
- High overall efficiency, minimized friction thanks to pioneering gear and bearing technology
- Reduced wear on screw housings and extruders



## 2. Thermoplastics Production Pumps

### Product Type



extrex<sup>6</sup> GU

#### General Use gear pump for thermoplastic applications

Extrusion operations require extremely reliable gear pump systems with high output consistency and a configuration to suit each application. The modular design of extrex<sup>®</sup> gear pumps easily meets the requirements for these diverse applications.

The extrex<sup>6</sup> GU gear pump is a general use design that elevates your process to the next level. With the new x<sup>6</sup> class design you have additional benefits compared to the classic gear pump designs. All pumps are available with ST design (flow optimized) and with the 5R design (Retrofit flange design classic pump).

#### extrex<sup>6</sup> EP

#### Extra Pressure gear pump for thermoplastic applications

The extrex<sup>6</sup> EP gear pump is an intermediate pressure solution for applications requiring higher pressure, greater load bearing considerations for low lubricity products.



#### extrex<sup>6</sup> SP

#### Super Pressure gear pump solution for thermoplastic applications

The extrex<sup>6</sup> SP gear pump is a high pressure gear pump for applications dictating high pressures and loads.

#### extrex<sup>6</sup> MP

#### Maximum Pressure gear pump for your thermoplastic applications

The extrex<sup>6</sup> MP is a high-pressure gear pump for the most demanding thermoplastic applications. With the new x<sup>6</sup> class design you have additional benefits compared to the classic gear pump designs. The flange design ST is already the same as the classic trudex<sup>®</sup>, so there is no need to change process connections when replacing classic trudex<sup>®</sup> pumps.



extrex<sup>6</sup> GU

#### General Use gear pump for thermoplastic applications

Extrusion operations require extremely reliable gear pump systems with high output consistency and a configuration to suit each application. The modular design of extrex<sup>®</sup> gear pumps easily meets the requirements for these diverse applications.

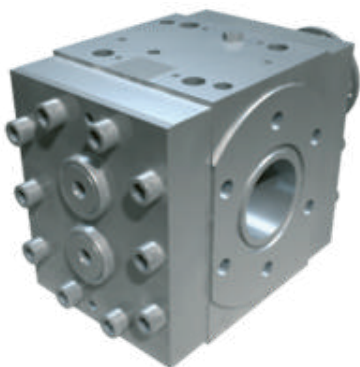
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## extrex<sup>6</sup> pump improvements over classic pump

	extrex <sup>6</sup> GU	extrex <sup>6</sup> EP	extrex <sup>6</sup> SP	extrex <sup>6</sup> MP
More pressure than classic GP	-	+40%	+32%	-
More specify volume than trudex <sup>®</sup>	-	-	-	+10%
More specify volume than classic GP	+10%	-	-	-
More specify volume than classic HP	-	+28%	+26%	-
More wear resistant than classic	+25%	+25%	+25%	+25%
Larger sealing surface than classic	+25%	+25%	+25%	-
Less energy consumption than classic	-12%	-12%	-12%	-12%
Less temperature increase than classic	-40%	-40%	-40%	-40%
Less pulsation than classic	-90%	-90%	-90%	-90%

## 3. Elastomer Production Pumps

### Product Type



extrex<sup>®</sup> RV/RB

#### High performance gear pump for rubber extruder

When it comes to manufacturing profiles and dealing with strainers, high requirements are placed on pumping consistency and extrusion lines. The new gear pump series extrex<sup>6</sup> RV/RB from MAAG raises the performance of gear pumps for elastomer extrusion to new levels in terms of both economy and processing technology. Product quality is guaranteed by a stable discharge, the lowest tolerance deviations and achieving process stability in quick time

Key feature:

- Highly efficient self-cleaning properties
- Low pulsation pumping even at high differential pressures
- Minimal temperature increase



extrex<sup>6</sup> ER

#### Booster pump for the elastomeric processing industry

Elastomeric processing requires positive displacement devices that gently convey high viscosity rubber through the system. Specifically designed, low compression tooth design allows the extrex<sup>6</sup> ER transfer, booster, or metering gear pump to achieve both high pressure and low shear.

Additionally, their anyway high efficiency and long life span will extend unrivaled due to reduced internal friction.

Key features:

- Wide viscosity, temperature, and pressure range
- High efficiencies (due to tolerances and small clearances being modified in line with applications)
- Precise displacement volume

## 4. Chemical & Industrial Pumps

### Product Type



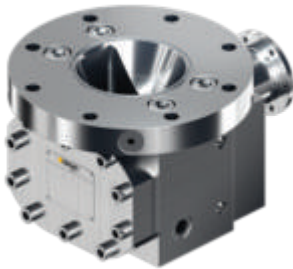
**cinox® therminox®**

#### Corrosion-resistant gear pumps for chemical processes

cinox® and therminox® gear pumps are corrosion resistant and heatable stainless steel conveying units that satisfy the stringent quality requirements of today's chemical processing industry. Whether the applications involve highly pure, corrosive, viscous or very hot media, MAAG pump systems hold the solution to meet every pumping challenge. cinox® and therminox® are especially suitable for medium-high flow rates.

Key features:

- Wide viscosity, temperature and pressure range
- High efficiencies due to tolerances being modified in line with applications
- Precise displacement volume



**cinox®-V therminox®-V**

#### Stainless steel discharge pump for chemical processes

The pump models cinox®-V therminox®-V are discharge pumps. They have been designed for highly viscous fluids, which are gently extracted from reactors and degassing devices even when the inlet pressure is low, ensuring optimum fill characteristics and short dwell times. This new pump series combines the outstanding flow characteristics of the polymer pumps with the exacting requirements of the chemical industry.

Key features:

- Optimum fill characteristics due to enlarged inlet and optimum inlet geometry
- Low pulsation
- High efficiencies thanks to application-specific clearances



**dosix™**

#### Corrosion-resistant dosing pumps for chemical processes

MAAG dosing gear pumps are corrosion resistant and electrically heatable conveying units, especially designated for the small throughputs; their three-piece configuration facilitates maintenance and replacement of internal parts, such as gears and bearings. Thanks to the wide range of components and materials available, dosix™ pumps can be configured to suit customers specific requirements and therefore, are far superior to standard pumps in terms of performance and reliability.

Key features:

- Precise displacement volume
- Low pulsation
- Suitable for step-motors

## 4. Chemical & Industrial Pumps

### Product Type



**flexinox™**

#### Corrosion-resistant gear pumps for chemical processes

MAAG flexinox™ pumps are corrosion-resistant conveying units; they satisfy the stringent quality requirements of today's chemical processing industry and their three-piece configuration facilitates maintenance and replacement of internal parts, such as gears and bearings. They can be heated either electrically or with fluid. Thanks to the extensive range of components and materials available, MAAG gear pumps can be configured to suit customers specific requirements and therefore, are far superior to standard pumps in terms of performance and reliability.

Key features:

- Wide viscosity, temperature, and pressure range
- High efficiencies due to tolerances being modified in line with applications
- Precise displacement volume



**refinex® refitherm®**

#### Cast steel gear pumps for industrial or petrochemical processes

Refinery and industrial plant applications are challenging. High process pressures and high temperatures are commonplace in such environments. Precisely in these environments MAAG gear pumps develop their full potential. Thanks to the extensive range of components and materials of constructions to choose from, MAAG gear pumps can be configured to suit customers specific requirements and therefore, are far superior to standard pumps in terms of performance and reliability.

Key features:

- Wide viscosity, temperature, and pressure range
- High efficiencies (due to tolerances and small clearances being modified in line with applications)
- Precise displacement volume



**hydrolub®**

#### Grey cast iron gear pump for industrial processes

Continuously operated equipment calls for reliable components. Whether in lubrication oil applications or in processing plants, a pump is required to work reliably and long lasting. Thanks to the extensive range of components and pump sizes, hydrolub® can be configured to suit customers' specific requirements and therefore, are far superior to standard pumps in terms of performance.

Key features:

- High efficiencies (due to tolerances and small clearances being modified in line with applications)
- Precise displacement volume
- Low pulsations for oil applications (helical gears)



## Gear Pump Applications

Filtration is a process that separates or cleans substances. The mechanical separation processes of MAAG filtration systems are physical. The principles are applied in filters and screen changers for separation and cleaning of plastic melts, chemical substances, and lubricants. They are also used in recycling, extrusion, roto-molding, in general industrial applications, and in the pharmaceutical and food industries.

### 1. Screen Changer

#### Product Type



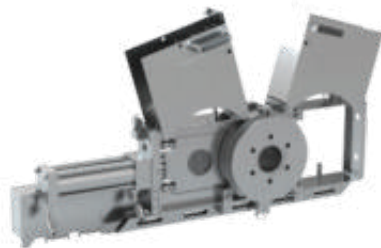
HSC

#### Manual screen changer for extrusion processes

Manual screen changers from Maag have been the first choice of cost-effective filtration systems in extrusion lines for many years. Here, the breaker plate is equipped with patented gearing and a pinion which allows an effortless screen change even in restricted space conditions or high sealing pressures. The manual screen changer guarantees the protection of gear pumps and fine extrusion die gaps from damage and dirt accumulation.

Key features:

- Simple operation with quick screen change
- Short material residence time
- Leak-free mode of operation



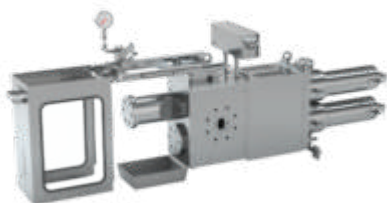
FSC

#### Plate screen changer for extrusion processes

FSC screen changers from MAAG are equipped with a pressure-adaptive sealing system as a standard. Thanks to this sealing system, the required sealing forces are adjusted to the actual melt pressure automatically. The narrow design is especially suited for being used in applications with thermally sensitive materials. Their solid and robust construction, available in all sizes and designs, ensures a reliable and leak free filtration of molten polymers for many years. The hydraulically operated screen changer reliably guarantees the protection of melt pumps and mold gaps from damage and dirt.

Key features:

- Short material residence time
- Leak-free mode of operation
- Flow channel geometry without any dead spots



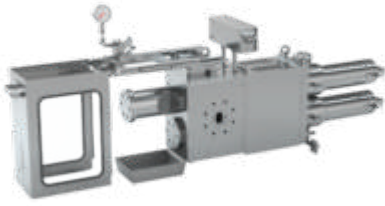
DSC

#### Single piston screen changer for demanding melt filtration

Discontinuous DSC screen changers from MAAG with their robust and leak-free operation meet highest quality standards with respect to melt filtration. DSC screen changers are based on the proven single-piston design that operates without any additional seals. Their sturdy construction available in all sizes and designs guarantees a reliable and leak-free filtration of polymer melts for many years.

Key features:

- Classic-Design as low viscosity feature available
- PE-Design: up to 2x more filtration area – more flexibility in handling with fillers
- R-Design: up to 4x more filtration area



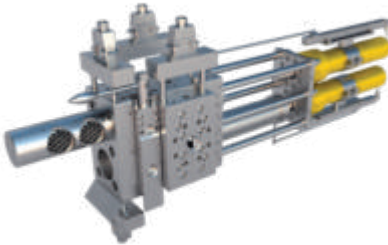
CSC

### Double piston screen changer for extrusion and compounding

Continuous CSC screen changers from MAAG with their robust and leak-free operation meet highest quality standards with respect to melt filtration. Due to their constantly improved functionality continuous screen changers from MAAG increase product quality significantly. CSC screen changers are based on the proven double-piston design that operates without any additional seals. Their sturdy construction available in all sizes and designs guarantees a reliable and leak-free filtration of polymer melt for many years.

Key features:

- Classic-Design as low viscosity feature available
- PE-Design: up to 2x more filtration area – more flexibility in handling with fillers
- R-Design: up to 4x more filtration area



CSC/BF-4F

### Backflush screen changer for maximum screen service life

MAAG backflush screen changers are based on the proven double-piston design which operates without any mechanical seals and is equipped with four screen cavities. This design is used mainly in recycling applications. Due to its fully automatic backflush function screen service life is maximized and the level of automation of the entire system is increased. Reduced operating costs and an enormous system availability are the main characteristics of this series.

Key features:

- Multiple screen usage
- Low pressure consumption
- Flow channel geometry without any dead spots

## 2. Large Area Filtration

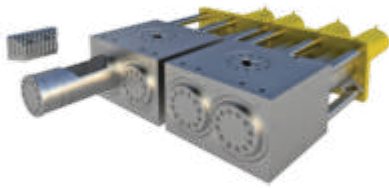
### Product Type



CSC-R

### Screen changer with curved filter screens

MAAG's CSC-R large scale screen changer with curved screens is designed for the use of one-way filter screens which do not require cleaning after the simple and safe screen change. The screen bearing pistons belong to MAAG's modular filter system and its patented design use 75% of the piston surface as active filtration area. Also this filter execution can be installed for vertical or horizontal melt flow directly at the reactor discharge melt pump or pelletizer booster melt pump to avoid additional piping for reduction of melt residence time.



CSC-C

### Screen changer with candle filter elements

MAAG's CSC-C large scale screen changer with candle filter elements is the right choice if short melt residence time, small footprint and a simplified candle change are required. Depending on the polymer type, melt viscosity, reactor throughput, and filter fineness, the screen changer size and number of pistons are customized to the application. The patented design allows the use of pleated micronex® candle filter elements with fiber metal felt (FMF) media, or cylindrical Multinex candles filter elements with interchangeable filter sleeves.



duplex

### Continuous large area polymer filtration systems

MAAG's duplex polymer filtration system was designed with considerable input from our customers. The result is a patented polymer filter system that offers process benefits such as minimized residence time and improved heat transfer efficiency.

Key features:

- Simplified vessel changeout
- Improved accessibility
- Safer operation



simplex

### Discontinuous large area filtration systems

MAAG-designed simplex polymer filter systems can be provided with either fixed or removable vessels. A compact preheat station with spare vessel is also available for locating near the polymer processing line for quick changeout. They are custom designed to minimize initial pressure drop and maximize polymer filter element life.

Key features:

- Less space requirements
- Minimized pressure drop
- Horizontal or vertical design

## Accessories for Pumps and Filtration Systems

For maximum productivity and top product quality in polymer production and processing, MAAG pump systems and filtration systems are complemented by an extensive range of additional equipment. All accessories are specially developed for the various gear pumps and filter solutions, and are matched to the MAAG products and systems.

### 1. Control for Pump and Filtration

#### Product Type



maax® 3S

#### Automation solutions for extrusion line retrofitting

The automation system maax® 3S simplifies the operation, control, regulation, and monitoring of the operating parameters. Production data are displayed transparently, and operation is simple and intuitive. Process and production safety of the line are increased. The maax® 3S automation system is particularly suitable for the retrofitting of gear pumps or screen changers in extrusion lines.

##### Key features:

- Simple and clear operation of the start-up and shutdown routines
- Quick and precise control of the extruder or pump speeds
- Independent start-up and production control of the pump speed



maax® 100S / 400S /

#### Automation solution

The maax® automation system simplifies operation, control, adjustment, and monitoring of the operating parameters. This guarantees optimum protection and operation of the extrusion gear pump system, melt pump system, and screen changer. Process and operational reliability of the entire system is increased. The maax® 100S automation system is the ideal solution for integrating melt pumps and screen changers into the extrusion line. maax® 400S is for upgrading coextrusion lines. The maax® 600S automation system is the ideal solution for equipping complete and complex extrusion and compounding plants in the polymer extrusion industry.

##### Key features:

- Simple and clear operation of the line-start and stop procedures
- Rapid and precise control of extruder and pump speed, Depending on application
- Scalable visualization of various operating parameters in a trend display



maax® BF

#### Automation solution for backflush screen changer

Maax® BF is MAAG's well-proven control system for the fully automatic backflush screen changers. It allows the processor of highly contaminated polymer melts simple handling of the backflush screen changer and fully automatic screen cleaning for multiple use of the built-in screens. The automation system is particularly well suited for retrofitting extrusion lines with automatic self cleaning screen changers with backflush function. Operation, control, regulation, and monitoring of operating parameters are simplified. Process and operation reliability of the filtration systems of the entire system are increased.

##### Key features:

- Simple and clear operation of filter and system functions
- Integrated temperature control of the system components
- Scalable visualization of different operation parameters in a trend display

## 2. Accessories

### Product Type



**Support Cart**

#### Support cart for multifunctional applications

Together with the extrex6 we can also provide the support cart as a package. The new multifunctional support cart can be mounted in 2 different directions and is also adjustable in the height.

Key features:

- Flexible solution for mult functional application
- More flexible installation position applications
- + 50 % higher flexibility + 50 % service friendly



**Drive units**

#### Single and dual drive units for extrusion gear pumps

Together with the extrex6 we can also provide the drive unit as a package. For optimum performance it is important the drive units are calculated to the application requirements and as accurately as possible. MAAG has both the experts and high-level modeling programs to assure just the right combination of torque, speed and efficiency.

Newly introduced is our Dual Drive unit designed for high abrasive, recycling and Fluoro polymer applications. The Dual drive unit is a MAAG own development to bring up an economical and effective solution for processes requiring minimum gear tooth and loading.

Key features:

- Calculated to your applications by expert with high level modeling capability
- Complete service solution
- Contact free operation of the gear pump



**multinex**

#### Filter elements for large-area polymer filtration systems

MAAG multinex polymer filter candles are tailor-made for use in continuously operating dual bolt screen changers of the MAAG CSC-P/C series for polymer filtration. Compared to typical polymer application round screen plates, they increase the active screening area up to 60 times, thus significantly reducing  $\Delta P$  and the flux rate. At the same time, up to 60 times the service life of the filter is achieved until the next screen change.

Key features:

- Reusable candle bodies
- Wire screen mesh or metal fiber fleece
- Filter fineness 5  $\mu\text{m}$



**micronex**

#### Filter elements for large-area polymer filtration systems

MAAG offers high-quality polymer filter elements designed for long term use and multiple cleanings. MAAG can provide standard design polymer application or build to your requirements regarding:

- Type of mesh
- Number of pleats
- Pleat height
- Filter area
- Number of layers
- Layer configuration

Key features:

- Filter elements designed for individual processes
- Lowest possible pressure loss
- Designed to retain hard and deformable particles



## Contact Us



We look forward to supporting you in getting to know more about DKSH's smart, productive, and profit-making PPC's solutions. Contact Zaki Firdaus Syahid, Senior Manager, Packaging, Printing & Converting (PPC), Technology, DKSH Indonesia at [zaki.firdaus@dksh.com](mailto:zaki.firdaus@dksh.com), or via our general email at [tec.indonesia@dksh.com](mailto:tec.indonesia@dksh.com), or phone +62 21 2988 8557.

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