MAAG Group
a DOVER company

AFTER SALES SERVICE
for virgin polymer production

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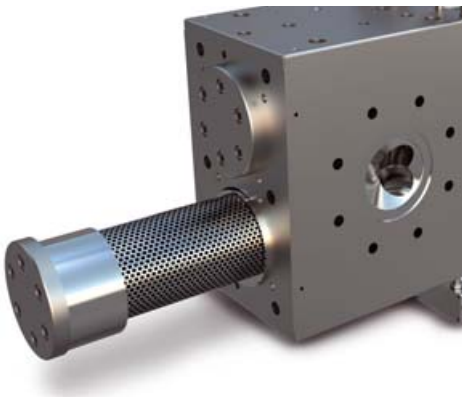
Strand cooling & Water treatment

Bearing and shaft cooling
Upgrade for polyrex® PR gear pumps size 12 or bigger.
Increasing the throughput or "debottlenecking" of existing plants is in many cases the most economical way to secure and extend the lifetime of your investment. MAAG would like to support customers by offering different solutions to increase the efficiency of the existing gear pumps, tailored for the specific application requirements.

Your Benefits:
- Higher throughputs
- Higher outlet pressure
- Higher efficiency



Retrofit-piston for existing CSC screen changers
2.5× more filtration surface due to new filter cavities.
The patent pending arched breaker plate offers up to 2,5 times more active filtration sur- face than existing pistons with round filter cavities. For retrofitting the screen changer remains in the extrusion line and only the piston needs to be replaced. Usually this is done by MAAG service technicians within one day. The filter handling and the venting procedure will remain the same as before.

Your Benefits:
- Maximization of filtration surface
- Extended screen dwell time
- Higher throughput
- Higher filter fineness
- Lower melt pressure

Throttle adjustment comfort for vispac® seals
Upgrade for vacorex®/viscorex®pumps
An adjustment throttle optimized by CFD analysis with an adjust- ment mechanism that can be set from outside the insulation, which makes operation easier and allows a reliable adjustment of the seal control pressure.

Your Benefits:
- Higher reliability and safety
- Longer lifetime
- Easier adjustments

Strand forming

Die head
The die head greatly influences the quality of the pellet to be produced. In conjunction with polymer valves and shut-off options, MAAG die heads are the ideal solution for any task of strand forming.

Your Benefits:
- Absolutely smooth and homogeneous distribution of the melt
- High throughout peformance with low pressure loss and short residence time (rheologically optimized product channels)
- Fast die plate exchange possible by preheating chamber and unloading station
- Automated lock system of the die plate during batch operation by Shut-off slide value (PA 6.6) and Freezing technique (PET)
- Short purging time for batch changes

Die plates
Choosing the right die plate for your product is the first step to achieve outstanding throughput levels and pellet quality. Many years of experience in process engineering make us the perfect partner for optimized die plates, no matter if you run common, specialty, experimental or novelty products.

Your Benefits:
- Wear resistant die plates for all applications and machine types
- Over 50 years of experience in pelletizing process engineering
- Consistent stability of throughput and process quality

Freezing of die plates
In order to prevent the flow of polymer at a production stop, MAAG developed a system which freezes the die holes and defrosts again at production start. This inhibits dripping or oxidation in the die head (e.g. PET or PA 6.6).

Your Benefits:
- No dripping
- No oxidation of materials in inaccessible areas
- No need of cleaning of mechanical parts

Strand cooling & Water treatment

Water box with cleaning openings
The optimized version of the water box combines improved flow characteristics with easier access to clean the inside of the box. Cleaning openings on both sides and the detachable water exit ledge also allow easy access to the inside of the water box and help to shorten the cleaning process.

Your Benefits:
- Smoother flow of water and strands
- Removable cleaning covers
- Prevention of dirt accumulations in the water channel due to improved design

Start-up plate with water guide sheet
The start-up plate has been designed for strand pelletizing systems with horizontal strand guide section. The water guide sheet acts like a bridge from start-up head to strand guide section, neutralizes the height difference and allows a smooth flow of water and strands.

Your Benefits:
- Less to no strand bonding, double pellets and therefore less waste production
- No manual sorting of strands anymore if a grooved start-up plate was used before
- No switching of start-up plates necessary when changing the number of strands

Process water treatment system
The process water treatment unit (PWA) serves for filtering, tempering, and circulating the process water in compound and masterbatch production and can be integrated into the base frame of the cooling trough or positioned externally. Using a heat exchanger, the PWA separates the contaminated process water circuit from the primary cooling circuit from the central water supply.

Your Benefits:
- Targeted process water cooling via plate heat exchanger
- High process reliability
- Low energy consumption
- Low operation and consumption costs
- Separation of process water from the central cooling water supply

Strand cooling & Water treatment

Dual filter system
Older under water strand pelletizing systems are often equipped with one water filter only. To prevent downtime for cleaning filters we created a retrofit kit to add dual filters to existing water distribution systems. With dual filters, one filter is always linked to the water circulation, while the other is available for backup.

Your Benefits:
- No downtime when filter needs to be changed
- Filter exchanges don´t cause loss of production
- Filter inserts of the standard system can be reused

Water distribution
Thanks to a new water distribution, the process stability is increased. The water distribution can be ideally combined with a dual filter system. The proven flowmeters are insensitive to soiling and contamination and can be easily cleaned in an emergency. The large displays of the flow-meters guarantee comfortble readability, whereby a slow drop in the flow rate can be detected at an early stage. The water distribution is designed in such a way that it can be exchanged with your current water distribu-tion without much effort.

Your Benefits:
- Comfortable readability of the flow meters by large displays
- Simple disassembly / cleaning off flowmeters
- Combinable with dual filter systems
- Exchange with the existing water distribution without great effort
- Insensitive to soiling and contamination due to float techniques

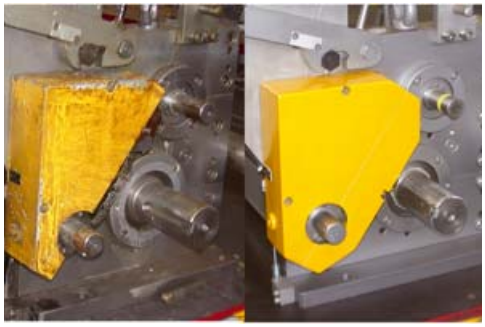
Spraying device with seperately exchangeable tubes
To install on our underwater strand pelletizing systems. By installed non-return valves in the spray bars, the spray tubes can be exchanged individually, which avoids excessive fluctuations in the water volume. In the case of corresponding replacement spray pipes, these can be cleaned without a time pressure.

Your Benefits:
- Separately exchangeable spray tubes with self-sealing bayonet lock
- No production stops necessary in order to clean and change the spray nozzles. The changing procedure is quick and safe.
- Less polymer waste, less production costs and higher system availability
- Covered pelletizer inlet for a safe operation
- Extended guard plate to protect the spraying device from getting blocked by melt

Wear & Tear parts

Spare cutter head
To be prepared for the worst case scenario it is highly recommended to have a certain quantity of spare cutter heads available to ensure the production. The spare cutting head is the fall-back position in case one cutter head is out for overhaul or the heads are getting worn out to much or due to an unexpected failure you need to replace the existing one in your production line.

Your Benefits:
- Being prepared for the worst case scenario
- Prepare the spare cutter head when your production is running
- No time pressure when changing wear and tear parts during production



Cutter head overhaul
Higher availability of strand pelletizing systems.
The cutting system is one of the key systems in your process. Regular Maintenance carried out by our specialists guarentees that it's always in best condition.

Your Benefits:
- Reduction of maintenance costs
- Complete overhaul at a fixed price
- Six months warranty

Improved bed knife holder
MAAG has developed an improved bed knife holder for higher productivity in a reliable process of your underwater strand pelletizing system USG 600 and USG 900. Due to a reinforced cross section of the knife holder, the wear resistance of the knife holder and stripper has been considerably improved.

Your Benefits:
- Higher productivity due to improved pellet quality
- Optimized adjustability
- Less angled or long pellets
- Higher cutting gap constancy

Drying - Screening

Efficient pellet drying technology for any application
MAAG is the only supplier to meet this variety of requirements with its range of dryers consisting of the AERO impact dryer, the CENTRO centrifugal dryer and the DURO belt dryer. The dryers are combined with the upstream pelletizing systems to meet the particular requirements for production. To meet the challenges of his customers MAAG has equipped the dryers with various options to offer the perfect solution.

Your Benefits:
- High drying quality for virgin polymers, compounds and products with any fillers and elastomer plastics.
- Drying of spherical, cylindrical pellets and micro-granular Compounds
- Wide range of operating capacities, from very small quantities up to 150 t/h
- Low life cycle costs when drying abrasive products

Dryer upgrades of impact dryer
Possibility to exchange older impact dryer by a centrifugal dryer.
The centrifugal dryer systems supplied by MAAG are suitable for use with PEARLO®, SPHERO® underwater pelletizing and M-USG and P-USG underwater strand pelletizing systems. Well thought-out and highly accessible components, such as the core rotor device, serve to provide excellent operating characteristics and efficient servicing. Possibility to change depending on specific application.

Your Benefits:
- Reduced energy consumption
- Lower residual moisture
- Adjustable rotor speed
- Pneumatic interlock of dryer doors for safe and easy servicing

Classifier
The classifier is used for separating spears, spelt's, chains, oversize's, and multiples from plastic pellets. Classifiers of the SRK-I-C and SRK-I-V type have been designed for the se- paration of oversized particles both in virgin polymer and compounding applications.

Your Benefits:
- Flat throwing angle
- Very low vertical acceleration
- No stand-up of over lengths on screening surface
- Easy cleaning
- High operating comfort
- Small inclination angle and favorable outlet height robust design

Wear & Tear Parts

Filter elements
The filter technology team at MAAG is committed to continuously improving and expanding the range of our large area filtration systems and candle based filtration systems. MAAG filter systems are the best choice for any application that requires the highest filtering quality and the shortest possible residence times. Our engineers have developed methods to model your conditions, resulting in the optimum filter system design.

Your Benefits:
- Minimized residence time
- Reliable operation
- Leak-free mode of operation
- Simple and safe handling

Cutting rotor
Different characteristics, like rotor material, number of teeth and more than 15 tooth profiles, can be optimized for every product in strand pelletizing to achieve best results in quality, throughput and lifetime.

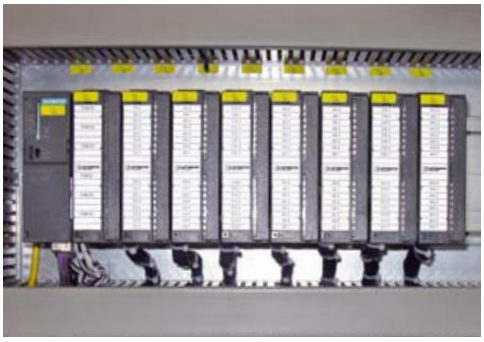
Your Benefits:
- High lifetime
- Special tooth profile and number of teeth for all applications
- Consistent pellet quality
- Less costs, due to specially selection for your application

Cutting blades, bed knives
The cutting edge for any application. The lifetime of the individual cutting edges of a cut- ting blade affect three important factors: pellet quality, system availability and production costs. Cutting blade material, (HM, CD, PCD).

Your Benefits:
- High lifetime of cutting edges
- Consistent pellet quality
- Less costs, due to specially selected for your application.

Retrofit Kits Electric

Conversion SIMATIC S5 to S7
As OEM with the largest installed machine base of pelletizers world-wide, we have the know-how and capability to upgrade your systems. For those customers who have not upgraded their system yet we highly recommend to do it as soon as possible to avoid the risk of a longer unplanned production stop. The Simatic S5 is no longer supported by Siemens with parts and services.



Your Benefits:
- Reliable supply of spare parts
- Minimizing the risk of an unplanned machine stop
- Foreseeable costs and conversion time
- Conversion of the old software by the OEM into the actual version

Exchange PIV gear for new drive
Maintenance and spare parts procurement of existing P.I.V. gear is getting bigger and more complex. The result of exchanging is reducing stillstand times of the system, since the new frequency-controlled drives are maintenance-free. In addition, the new drives are more space-saving in their design, which significantly increases the accessibility to the machine components.

Your Benefits:
- Generally very high maintenance costs of PIV transmissions
- No longer available spare parts can cause loss of production
- Higher production safety after conversion
- Conversion parts and components available as ET for a long time
- Warranty on all parts and components
- Additional conversion of the machine to the latest safety standard

Operator panel
The operator panel is in constant use of the operator and is working under extreme conditions. As all electronic devices suppliers we are continuously evaluating new components and replacing old ones. MAAG is helping its customers with the latest upgrades to ensure production, in case the panel is not available any longer.

Your Benefits:
- No unplanned longer machine stops due to non available parts
- New and functional operator panel
- Avoiding unplanned machine stops

Repair & Overhaul

Screenchanger repair and overhaul
At central locations around the globe MAAG is offering the repair and overhaul of screeenchangers. The executed work will include the hydraulic unit, all mechanical parts as well as the safety devices. To enable a fast and reliable support we even keep spare parts locally in stock, to ensure quick repairs.

Your Benefits:
- Fast, reliable support from experts
- Wide-ranging screenchanger cleaning and overhaul options
- Longer equipment life, safeguarding your capital investment
- Improved operational reliability
- Improved productivity thanks to higher machine availability

Pump repair
You will find gear pump repair workshops worldwide at various MAAG locations. We repair and overhaul gear pumps from many different sectors, including manufacturing industry, chemicals, extrusion, polymers and compounding. In order to offer you a full service from a single source, we have vacuum pyrolysis ovens for pump cleaning.
We even keep many parts locally in stock, to ensure quick repairs.

Your Benefits:
- Fast, reliable support from experts
- Wide-ranging pump cleaning options
- Longer machine life, safeguarding your capital investment
- Improved operational reliability
- Improved productivity thanks to higher machine availability

Resharpening- and Repair-service
Sharpening of cutting rotors is the key process in terms of the service life of the rotor. The operation time of a cutting rotor between two sharpening procedures, its overall service life, and the quality of the pellets is heavily dependent on precision sharpening.

Your Benefits:
- Resharpening with preservation of the tooth profile
- Longer lifetime of cutting tools
- Guarantee of quality with certificate
- Resharpening and repair available at 6 service centers worldwide
- Resharpening with preservation of the tooth profile
- Repair of tungsten carbide rotors by replacing of knives

General Services & Support

Laboratory for trials and development
Experiment, develop, produce, optimize…
To support customers in developing new products and processes, we maintain test and development centers at several locations around the globe to develop and test new technologies and materials.

Your Benefits:
- Pelletizing trials with your materials
- Optimization of your pelletizing process
- Testing of prototypes
- Practical training of your personnel

Calculation tools
Saving your time and money by offering high quality products is our mission. With our calculation tools we need only a few parameters to show you how.

Your Benefits:
- Choose the best solutions for your application
- Cost transparancy
- Easy and quick calculations

Pelletizer system check
On-Site-inspection of pelletizing equipment by MAAG experts.
The inspection follows a logically structured checklist and therefore allows determining the condition of your machinery fast and uncomplicated. After the inspection you receive a detailed report describing the condition of your machinery and with recommendations on probably necessary preventive measures to maintain high machine availability.

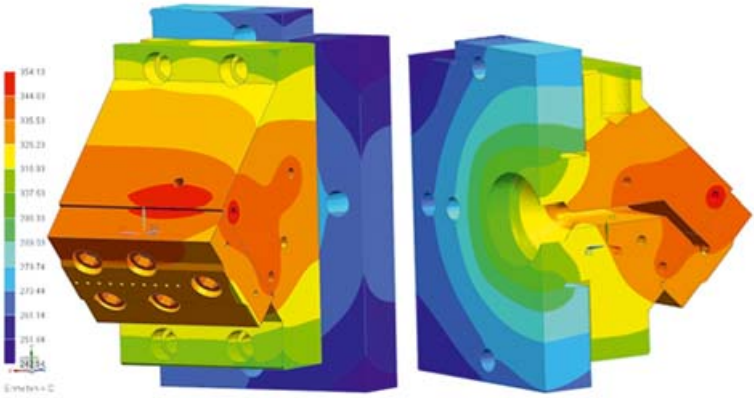
Your Benefits:
- Prevention of unplanned machine downtime
- Increase of production reliability
- Reduction of maintenance expenses

Repair & Overhaul

The five market leaders Automatik, Gala, MAAG, Reduction Engineering Scheer, and Ettlinger combine their specific process know how under the roof of MAAG.
Comprehensive process analysis is gaining enormously in importance, especially in view of rising competitive pressures and the demand for greater cost-effectiveness. Only if all the individual components of a system are ideally matched and coordinated waste can be minimized, downtimes reduced, product quality improved and production and energy costs saved. Only if all the subprocesses intermesh can an efficient overall process, with stable production and minimal unscheduled downtimes, can be attained.

It is that masterly overview of all process steps, in particular, which has made MAAG the market leader it is today. Our know-how developed over decades of experience means you can be sure of having an expert partner at your side even when confronted by the toughest of challenges. It is precisely that know-how – and the promise to our customers of fast, expert support and assistance – which differentiates MAAG from other vendors in this industry. Alongside expertise in hardware, a sound understanding of the overall process executed by a plant is vital, and is an increasingly key factor in achieving efficient production.

Based on the largest pilot plant installation of its kind, MAAG has built up a level of know-how in pelletizing, filtration and pump engineering which is unique worldwide over recent
decades. The provision of specialist advice and process support is an integral part of what MAAG offers today, and its wealth of know-how is respected and utilized by many customers all over the world.



We focus particularly on rapid problem analysis and regular consulting with our customers, which is why we invest in ensuring specialists are on hand to provide local support. MAAG thus combines in-house machinery manufacturing, full after-sales service – including repairs/sharpening and process optimization – with advice on process issues, all from a single source.

Our customer support services are implemented by an international network of agents and our own branch offices, deploying highly trained specialists all around the globe.

MAAG delivers comprehensive service worldwide – and that is what differentiates us from all other vendors in this industry.

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PULVERIZING SYSTEMS › REDUCTION
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