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MAAG AT A GLANCE – Products and Services

 **MAAG** Group
a **DOVER** company



NEXT LEVEL SOLUTIONS



Integrated systems for optimum production results

It is our goal to be the world's leading solution provider for the polymer, chemical, petrochemical, pharmaceutical, and food industries - with integrated system solutions along the value chain. We offer not only Pump & Filtration Systems, Pelletizing & Pulverizing Systems, and Recycling Systems. Through intelligent control systems, we make your processes ready for the age of Industry 4.0. All components, products and systems of our product brands AMN, AUTOMATIK, ETTLINGER, GALA, MAAG, REDUCTION, SCHEER, WITTE, and XANTEC are of the highest quality and have excellent performance values. Within MAAG Group, innovations, cutting-edge technology, and extensive after-sales service form the basis for providing solutions to meet demanding customer requirements in production, processing, and recycling.

NEXT LEVEL SOLUTIONS – this promise summarizes the services of MAAG Group in a nutshell. It signifies the maximum added value we provide for our customers through understanding their goals and processes. It expresses the development of high-quality and high-performance solutions by international and interdisciplinary development teams within MAAG Group. It signifies value for money for sustainable and long-lasting products, equipment, and systems. It means we maintain a global service network to offer our customers the upmost productivity of their machines. It stands for the security to press on with the development of advanced solutions in the sense of a circular economy for plastics. It concerns the future viability of producing and processing modern polymers as innovative materials for a wide range of applications.



PUMP & FILTRATION SYSTEMS ›



MAAG is a pioneer and technology leader in the development and manufacturing of customized gear pumps, filters, and screen changers, including system solutions. Our experience can be traced to the founding of our company in 1910. The first MAAG gear pumps were patented in Switzerland as early as the 1920s.

WITTE got its start in 1984 as a spare parts supplier for MAAG gear pumps. Over the years, the team developed customized gear pumps and is thus able to optimally support their customers' processes.

PELLETIZING & PULVERIZING SYSTEMS ›



GALA has been known for over 60 years for innovative technologies for underwater pelletizing and drying in polymer processing and production. GALA equipment is used for processing polymers for hot melt adhesives, color masterbatches, soft and rigid PVC, and for processing many other polymers as well as carriers for medicine and food applications. The drying process is carried out by powerful centrifugal dryers. With customized die plates, knife holders and knives, AMN enhances the MAAG Group portfolio with high performance tools for all underwater pelletizing applications and throughputs.

In the production of plastic powders from pellets or re-grind, the pulverizing systems from REDUCTION have been successfully in use.

AUTOMATIK has been a leader in the development of systems for the production of plastic pellets for more than 75 years. The latest technologies and a wide range of expertise in every pelletizing process and every pellet shape consolidate the leading position of the MAAG Group. A revolutionary process, by which technical plastics can be pelletized under water without a vacuum, can be traced to the research and development competence of this brand.

One umbrella brand. Four fields of competence. Eight strong product brands.

The high-performance product brands AMN, AUTOMATIK, ETTLINGER, GALA, MAAG, REDUCTION, SCHEER, WITTE, and XANTEC look back on company histories that extend to the beginnings of the chemical and plastics industries. The competences of the individual companies are concentrated under the umbrella brand MAAG Group in the fields of Pumps & Filtration Systems, Pelletizing & Pulverizing Systems, Recycling Systems and Digitalization. Over 1,500 employees from all fields of competence at 20 locations worldwide draw on many years of industry experience, applying their comprehensive knowledge day after day in consulting, engineering, planning, production, aftersales, and maintenance to fulfill our customers' requirements and wishes. The intensive knowledge transfer between the fields of competence forms the basis for the technological innovation of MAAG Group, allowing us to meet diverse customer requirements in the polymer, chemical, petrochemical, pharmaceutical, and food industries today and in the future.

RECYCLING SYSTEMS >



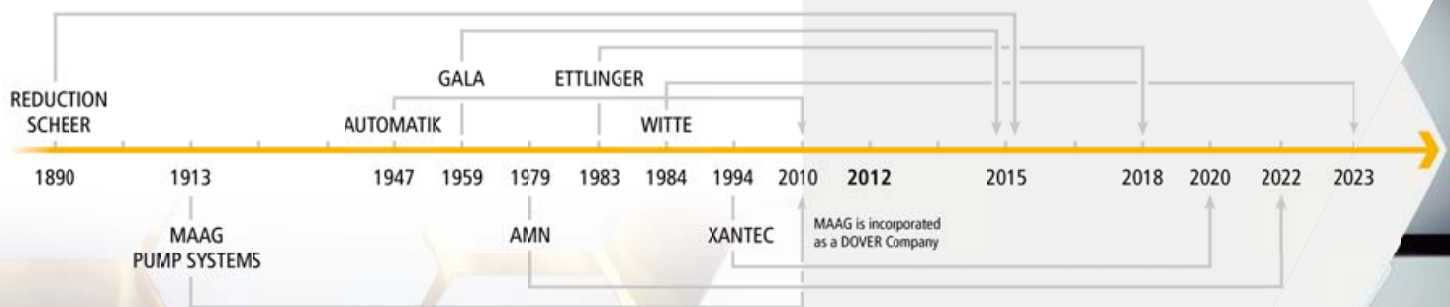
ETTLINGER's expertise lies in the field of high-performance melt filters. Our continuously operating, self-cleaning melt filters prove their functionality and efficiency in industrial applications worldwide, especially in the processing of a wide variety of recycled plastic materials. In combination with other MAAG products, a wide range of possibilities for the processing and reuse of plastics. In comprehensive recycling lines we offer solutions for a modern recycling economy of polymers. In combination with other MAAG products, a wide range of possibilities arise with regard to the processing and reuse of plastics. Our comprehensive product lines for recycling contain trend-setting solutions for the modern recycling management of polymers.

DIGITALIZATION >



XANTEC - this name stands for innovative automation solutions and efficient process control designs. With the highest degree of flexibility and expertise, we offer our customers reliable and sustainable support. We develop Industry 4.0 capable solutions, that enable intelligent control and communication of all systems and components. Through digitalization, we accompany you on the way to an automated production.

Development of MAAG Group



PUMP & FILTRATION SYSTEMS >

Gear pumps and pump systems

Pressure building capability with minimal temperature or energy influence on the polymer and a uniform output without pulsation – this is the traditional job of a gear pump. With our x⁶ class, we are setting new performance standards to the industry: higher product quality, better volumetric efficiency increased production capability, compared to earlier pump generations.

Extrusion/Elastomer & Compounding

Our gear pumps optimize the extrusion process of thermoplastics and elastomers since they ensure a constant flow of material, generate the required operating pressure and therefore relieve the extruder of pressure build-up. This increases the production plant's performance, improves the quality of the end product, performing at lower melt temperatures extends the extruder's lifetime. The innovative design allows highest speeds and highest throughput rates for a given pump size.



extrex⁶ GU

Viscosity	up to 30,000 Pas
Temperature	up to 350 °C
Throughput	up to 16,000 kg/h
Differential pressure	up to 500 bar

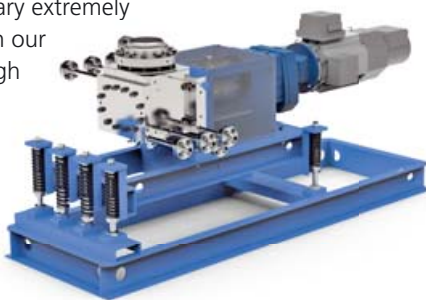
Virgin-Polymer

Our pumps for virgin polymer production are used in different processes at low and high-viscosity applications where they provide the best available performance in the market. Thanks to outstanding filling properties and short residence times they are suitable as discharge pumps. In compounding processes they build up the pressure after the compounder for downstream equipment. In reactors our pumps prevent the pressure overlay, thus ensuring an efficient production process.

Viscosity	up to 20,000 Pas
Temperature	up to 350 °C
Throughput	up to 170,000 kg/h
Differential pressure	up to 320 bar

Industrial/Chemical

Conveying media and operational requirements vary extremely in different industrial and chemical applications. In our portfolio you will find the best in class low and high viscosity gear pump to optimize your process in terms of efficiency, accuracy, reliability and safety. Therefore we offer corrosion and abrasive resistant pump systems for high temperatures and high pressures.



ChemCore®

Viscosity	0,3 up to 4,000,000 mPas
Temperature	up to 320 °C
Throughput	up to 2,400 l/min
Differential pressure	up to 200 bar





Duplex DV Filter



CSC

Filtration systems

Virgin polymer production

Reliable filtration has become a given in the polymer production process. The degree and rates to which they have to be filtered, is increasing. That is why we are committed to continuously improving and expanding the range of our large area filtration systems. MAAG offers vessel based large area filters as well as screen changer technology, that allows changing screens on the fly.

Extrusion & Compounding applications

Our modular continuous and discontinuous slide plate, single and double piston screen changer design offers the right screen changer for any extrusion application, throughput rate and filter fineness. All filter sizes are available with flat screens, arched screens, and candle filter elements.



Different cavity options for screen changers (round, oval, arched, candles)



PELLETIZING SYSTEMS >

Strand pelletizers

Dry cut:

Throughput	up to 12,500 kg/h
Motor power of pelletizer	up to 75 kW
Number of strands	up to 225
Line speed at pellet length of 3 mm	30–120 m/min

Wet cut:

Throughput	up to 20,000 kg/h
Motor power of pelletizer	up to 37 kW
Number of strands	33–152
Line speed at pellet length of 3 mm	80–350 m/min

Pultrusion:

Max. throughput	2,300 kg/h
Motor power of pelletizer	60 HP (44.74 kW)
Number of strands	up to 150
Line speed at pellet length of 12.7 mm	135 m/min

Whether for complete high-performance production systems, or small machines for lab applications, MAAG Group tailors strand pelletizing solutions to meet exact customer requirements and preferences. Our pelletizers are available as stand-alone components or automated systems to create virgin polymers in continuous or batch productions as well as compounds, blends and masterbatches of highest quality.

Successfully used by hundreds of customers, our dry cut strand pelletizing systems produce cylindrical pellets or micro pellets, ideally suited for further processing. Our underwater strand pelletizing systems are especially designed for medium up to the highest production capacities. The systems are available in various configurations to meet the exact processing requirements of any virgin or reinforced polymer. With our belt conveyor pelletizing system we also offer a smart solution for processing highly filled (> 60 %) and/or fragile compounds.

Our pultrusion cutters for cutting long glass fiber, have been the benchmark for decades. Pultrusion technology helps compounders of long fiber reinforced materials to achieve faster line speeds. Our unique technology ensures the strand control necessary for pellet accuracy and quality, at the same time providing ease of cleaning and maintenance accessibility.

Modern production monitoring systems enable to maintain the highest quality standards.



M-USG



PRIMO E

 **SCHEER**

 **AUTOMATIK**

 **REDUCTION**

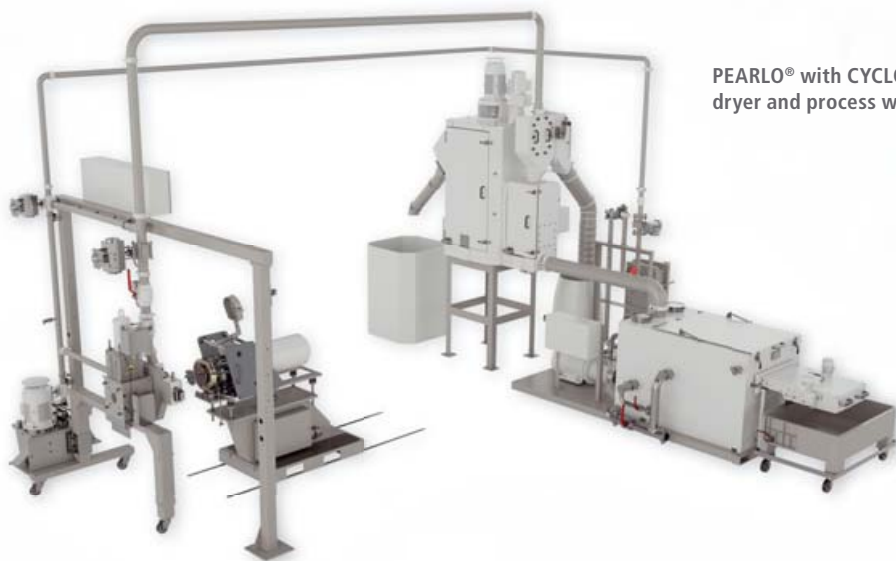
Underwater pelletizers

Our underwater pelletizing systems are first choice for compounding, masterbatch and virgin polymer production. They produce mostly spherical pellets of superb quality including micropellets as well as other shape pellets, ideally suited for further processing.

We provide solutions for your processing needs with safety, efficiency and profitability. Our wide array of applications ranges from commodity plastics, engineered polymers and recycling to engineering resins and reaction processes and hot melt adhesives, gum base and biopolymers. Design flexibility and efficiency – to meet your needs: our pelletizers are available as floor mounted, on rails or top mounted models with a small footprint. MAAG Group offers complete systems, optimized for the application, from pelletizing to drying as well as measuring and control systems.

Our direct crystallization process technology avoids the use of expensive pre-crystallizers prior to taking the pellets into downstream after-treatment processes.

Throughput	2–80,000 kg/h
Motor power of pelletizer	2.2–90 kW
Number of die holes	1–900



PEARLO® with CYCLO®
dryer and process water systems



PELLETIZING SYSTEMS >

Die plates and cutting tools

AMN's large die plates and special cutting tools are not only suitable for use in GALA underwater pelletizers.

We've gained unique expertise and know-how in the design of pelletizing dies of any sizes or throughput, to serve all kinds of applications.

To further support customers in the evolution of their products, AMN has developed specific processes to meet the growing demand for acid, peroxidized or highly filled polymers. Through central water injection systems, hydrodynamic knife profiles or acid-resistant materials, we provide solutions for the most demanding polymer productions.

With a "plug and play" approach, AMN products are always designed to fit the customer's environment and products, while still providing greater longevity and performances.



Complete CIS cutting head solution

PULVERIZING SYSTEMS >

Pulverizers

We design and manufacture our pulverizers with the flexibility to easily evolve with your business. The need for higher productivity, better product surface quality, and shorter molding cycles has resulted in machines that are easy to operate and deliver maximum efficiency with minimum waste or down-time. Almost 25 years of experience and constant development based on customer feedback are leading to our state-of-the-art product portfolio meeting the individual requirements. Our range goes from small units for lab trials and small sample production over medium size production systems with short change-over times. Our big systems are characterized by high outputs and best performance in relation to kilograms produced over power consumed.

The Disposable Discs technology helps our customers to reduce their operating and maintenance costs. Cost- and time consuming regrinding off-site is eliminated by simply replacing the discs by a set of new ones.

By using our color mixers, the cleaning times of a central mixer can be eliminated. Pellets are dyed directly from the pulverizer or from a silo.

REX duo



RECYCLING SYSTEMS >

Melt filters

From individual components to complete systems ready for connection following an extruder: MAAG Group supplies the plastics processing industry, and consequently end users, with sustainable solutions for meeting recycling challenges, thus making an active, customer-oriented contribution to the circular economy.

The core component of MAAG Group Recycling Systems is the ETTLINGER high-performance melt filter for filtering heavily contaminated plastics with the highest purity and maximum throughputs. Screen changers, melt pumps, under-water pelletizers, or strand pelletizers of the GALA, SCHEER, AUTOMATIK, and REDUCTION product brands can be combined to result in a perfectly coordinated unit. The appropriate XANTEC control system ensures a stable and efficient process that delivers consistent quality.

Our recycling systems are directly integrated into the process so that pelletizing as an intermediate step is not necessary. In direct extrusion from ground-up recycled material, for example, a food packaging film can be made of 100% RPET, or other products such as fibers, sheets, or tubes.



ERF 1000

Total filter area	up to 6,280 cm ²
Throughput	up to 10,000 kg/h
Operating pressure	up to 300 bar
Operating temperature	up to 300 °C
Degree of contamination	up to 18%

DIGITALIZATION >

Digitalization

XANTEC exemplifies experience and impeccable quality. For over 25 years, we have been delivering automation solutions to production plants all over the world utilizing our state of the art planning, design, programming and manufacturing processes. MAAG Group systems and components have always been optimally matched to meet any process engineering needs.

With XANTEC, we now also offer digital solutions from a single source. The process parameters of all components are coordinated to achieve the best possible efficiency for your plant. As specialists in control systems engineering and data processing, we support our customers in their capital projects, from the initial outline idea to handover of the operational plant. Tangible benefits are delivered to our customers: proven, cost-effective solutions; protection of their investment; and high availability of spare parts.

Whether innovative automation solutions or efficient process control designs: we apply tried and tested industry standards in digitalizing your processes. XANTEC's specialists develop tailored system solutions for their business partners based on proven components, ensuring easy integration into their existing plant environment. The deployment of validated solutions minimizes risk and guarantees fail-safe operation.

Standardized, production-independent modular control systems for pumps and screen changers, pelletizing systems and extruder controls lead the way into the age of Industry 4.0. Depending on the scope of the project, we specify a range of visualization options from simple text displays to complex graphical operator panels which also enable archiving and analysis of data.

We are certified by TÜV Süd for the USA according to UL508A, "Industrial Control Panels", and for Canada according to CSA C22.2 No. 14, "Industrial Control Equipment".

Service around the clock. Worldwide. Face-to-face. Digital.

At MAAG Group, service is far more than supplying spare parts. Intensive customer contact and supporting a range of customers, from small and specialized ones to large, multinational polymer manufacturers, has provided us with expert service knowledge found nowhere else in the industry.

Our experts within our fields of competence support our customers remote or face-to-face by presenting solutions that fit their unique requirements. We start with the important step of a comprehensive process analysis. Only if all individual components of a system are ideally matched and coordinated can waste be minimized, downtimes reduced, product quality improved, and production and energy costs saved. The results are higher production performance and minimal unscheduled downtime. Thanks to integrated machines, we can use real-time data to perform predictive maintenance on the customer's plant and optimize its operation and service life. Even remote start-ups are already possible today.

With a very large number of machines and systems installed at over 25,000 customers worldwide, MAAG Group has over the past decades built up a high level of expertise in pump technology, filtration, pelletizing, pulverizing, and recycling that is unique in the world. With a high level of expertise in control system technology and data processing, the digitalization experts of the MAAG Group develop investment projects with their customers - from the first rough idea to the handover of the operational plant. Specialized consulting and process support is an essential part of MAAG Group's current range of products and services and its extensive global network of services.

MAAG Group maintains service centers in Germany, Switzerland, Italy, France, Malaysia, the USA, Brazil, China, Thailand, and India. With these worldwide locations and their associated proximity to customers, we have earned a reputation for providing prompt, reliable service to our customers – before, during, and after the purchase. In addition, an extensive inventory of wear and spare parts is always available for immediate shipment. Since all spare parts are manufactured to original specifications, our customers can always rely on their design, quality, and reliability to keep their systems running at peak performance.

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my  **MAAG**



»» Original spare parts
at your fingertips! ««



We are where our customers are



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