

M-USG

Underwater pelletizing strand systems
Top-class pelletizing technology



The M-USG underwater pelletizing strand system has been producing virgin polymers all over the world for decades. The extremely flexible system guarantees a high level of system availability, especially in continuous operation, and fulfills the very highest demands in terms of cylindrical pellet quality.

Your benefits

- Outstanding, constant pellet quality
- Throughputs up to 20,000 kg/h
- Increased degree of system availability thanks to quick-change cutting head
- High level of automation
- Long service life of extremely wear-resistant cutting tools
- Easy accessibility – user-friendly for operation and maintenance
- Most reliable

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Underwater pelletizing strand systems – Benefit from our long experience

Maag Automatik equipment is a byword for economy, flexibility and reliability worldwide. Thanks to its more than six decades of experience, the company current over 8,000 pelletizing systems in production, delivering maximum profitability to the customers.



Applications

M-USG systems are used to pelletize technical thermoplastics such as:

- Polyesters, e.g. PET, PBT, PEN
- Polyamides, e.g. PA 6, PA 6.6, PA11, PA12
- Acrylic resins, e.g. PMMA, PAN
- Polyacetals, e.g. POM
- Polycarbonates, e.g. PC
- Styrene polymers, e.g. HIPS, GPPS, ABS, SAN
- Liquid crystal polymers
- Other plastics on request

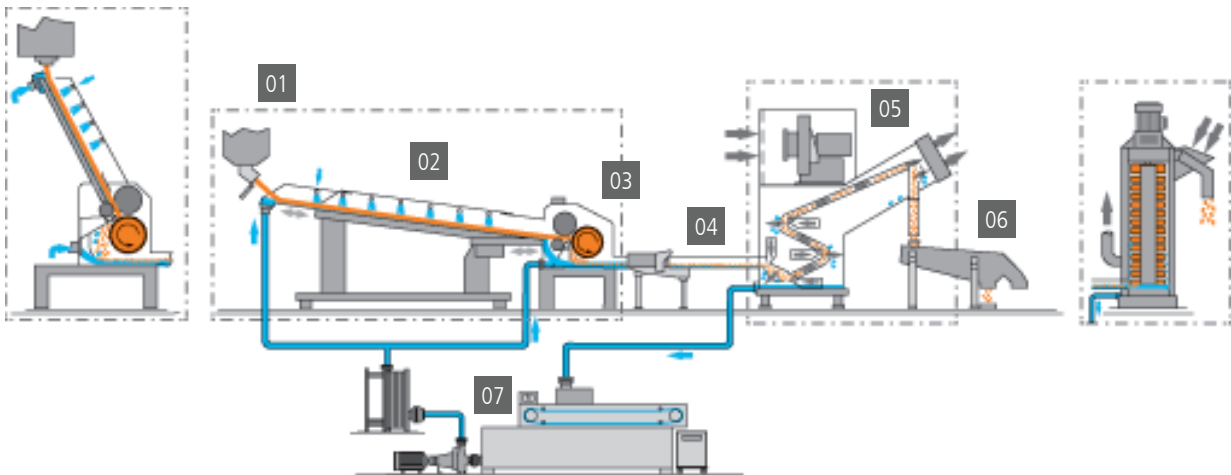
How the M-USG system works

The plastic melt is fed to the die head **01**. Polymer strands are extruded through the die plate. The strands are automatically routed by a start-up device into the strand guide section **02**, then carried by a water flow running parallelly with the pelletizer and cooled by water with spray nozzles.

In the pelletizer **03** the polymer strands are automatically captured by the intake device, guided to the cutting device and cut into pellets under water.

Immediately after being cut, the pellets are flushed by water into the after cooling line **04**, where they are cooled down to the desired temperature. An agglomerate separator separates the start-up material from the well-formed pellets and prevents clogging upstream of the dryer. In the dryer **05**, 95 percent of the water is removed by a preliminary dewatering system before the rest is removed when the pellets pass through the dryer. The following steps **06** are screening and conveying processes.

The process water is filtered and temperature-controlled in the water treatment unit **07** before being returned into the cycle.



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Underwater pelletizing strand systems – High availability improves profitability

The extensively tested and approved M-USG underwater pelletizing systems are designed for middle to top range production outputs, and produce cylindrical pellets of the best quality. The system's high level of availability is a key feature. All system components – such as die head, strand guide, after cooling line, dryer and screen machine – are designed to meet all your high demands in terms of process continuity and safety.

A wide range of machine models, delivering throughput rates up to 20,000 kg/h based on strand speeds up to 350 m/min, is complemented by a selection of installation layouts and options.

M-USG V with vertical strand guide section

- Short cooling line: 800, 1500 or 2200 mm
- Space-saving compact design
- Quick and easy operator control
- High degree of process safety
- Safety devices



M-USG 900 V

M-USG H with horizontal strand guide section

- Long cooling lines: 2000, 3000, 4000, 6000, up to 9000 mm
- Outstanding ease of accessibility to die head and cutting head
- High degree of process safety
- Soundproofing devices guarantee a measurement surface sound-pressure level of less than 85 dB(A)



M-USG 900 H

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Underwater pelletizing strand systems – Guaranteeing outstanding pellet quality

Optimum component selection ensures high guarantees of availability, making the pelletizing process more cost-effective. Due to system layout operators have easy access for operation and maintenance.



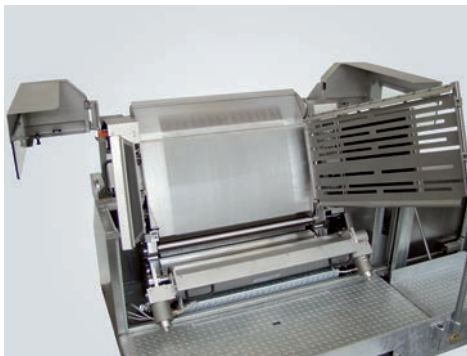
Die head with die wiper

Polymer valve

- For batch and continuous mode, providing controlled shut-off of the polymer melt at the reactor or in the melt pipe
- Vacuum tight piston with metal seal
- Shut-off pressure up to 160 bar
- Compact design, short product channels, no dead zones

The die head - the first guarantee of outstanding pellet quality

- Liquid, electric or steam heating
- Strand conformity and no strand clumping after discharge, thanks to absolutely uniform melt distribution
- Compact design, short product channels, no dead zones, small volume
- Quick exchange of die plate due to pre-heating chamber
- Automated closure of die plate in batch mode by slide or freeze technique
- Die wiper



M-USG 1200 V strand guide

Strand guide section

- Automatic strand feeding at start-up and during production in case of strand breaks

Vertical design with start-up head – M-USG V

- Movable start-up head ensures maximum precision at start-up
- Space-saving design with easy access to die head
- Single-strand feed prevents strands from clumping
- Safety covering



M-USG 1200 H start-up device

Horizontal design with start-up device – M-USG H

- Height-adjustable start-up device for easy adaptation to process parameters
- Spray nozzles removeable by quick-exchange
- Soundproof cover
- Slidable inlet provides easy access to cutting head

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Underwater pelletizing strand systems – Guaranteeing outstanding pellet quality

Pelletizer

- Uniform strand feed to cutting rotor thanks to the short distance between intake and cutting device
- High degree of cutting gap accuracy thanks to solid, gapless knife holder
- Optimum design of cutting head prevents pellet deposits
- Upper feed roll bearings outside of cutting chamber
- All bearings feature maintenance-free sealing against damp
- Easy cleaning and setup
- Quick and easy cutting tool exchange
- Automatic pellet length adjustment



Cutting head

Cutting head quick-exchange in about 5 minutes

by quick decoupling of the drive and pneumatic assembly. Easily to be carried out by using lifting gear, with no need for any other tools.

Measurement surface sound pressure level below 85 dB(A)

Water distribution system

Installed directly at strand guide section for ease of operation

After cooling line

- Adaptation to room conditions in production mode
- Agglomerate separator separates start-up material and overlength



Cutting gap setting



Cutting head quick-change



Roller bearing support outside of cutting chamber

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Underwater pelletizing strand systems – Only the quality of the system configuration counts



CENTRO centrifugal dryer

CENTRO centrifugal dryer for energy-efficient drying

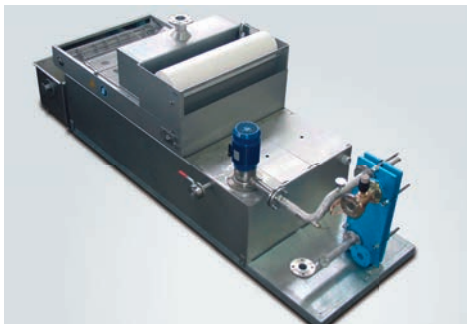
- Compact design offering easy access for cleaning and maintenance
- Integrated water pre-separator
- Easy to change wearing parts, such as rotor blades
- Low power consumption
- Rotor speed control – optional
- Pellet distributing flap at dryer outlet – optional
- Self-cleaning system – optional
- Special applications for micro-pellets



AERO impact dryer

AERO impact dryer

- Extremely gentle pellet drying
- Integrated preliminary dewatering system
- Minimal surface moisture
- Quick and easy cleaning
- Exhaust air dehumidification by drip-separator
- Soundproof blower



Process water treatment system PWS-BF

Process water treatment system PWS-BF

- Continuous filtration
- Easy handling of disposable fabrics
- Pressureless filtering
- Water tank with automatic level control
- Combinable with various pelletizing lines
- Upgradable with standby temperature control and pump systems



Control panel

Machine control

- User-friendly panel operation directly at strand guide section
- Single-button automatic system ensures a fast and error-free start-up
- Strand speeds adjustable without reprogramming
- Standard S7 PLC with Profibus interface
- User-friendly error analysis
- All component functions can be integrated into the pelletizing system control
- Data exchange with higher-level instrumentation and control system

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Technical data

Technical data:	M-USG 300 H	M-USG 600 H	M-USG 900 H	M-USG 1200 H
Working width:	300 mm	600 mm	900 mm	1,200 mm
Cutting rotor drive power:	11 kW	18.5 kW	30 kW	37 kW
Feed roll drive power:	5.5 kW			
Draw-in speed:	80-350 m/min			
Number of strands*:	33-40	66-80	100-120	127-152
Strand guide length:	3,000/4,000/6,000/8,000 mm			
Water flow:	20 m ³ /min	35 m ³ /min	45 m ³ /min	55 m ³ /min

* Dependent on product.

Throughput [kg/h]*:					
Polymer:	Average pellet weight				
PET/PBT:	30-40 mg	5,500	11,000	16,000	20,000
PA 6.6:	20-25 mg	4,200	8,400	12,600	14,500
PA 6 n. e.:	10-15 mg	2,200	4,500	6,700	8,600
PC:	20-25 mg	3,000	6,000	9,000	12,000

* Other products on request.

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Working width:	300 mm	600 mm	900 mm	1,200 mm
Cutting rotor drive power:	11 kW	18.5 kW	30 kW	37 kW
Feed roll drive power:	5.5 kW			
Draw-in speed:	80-350 m/min			
Number of strands*:	33-60	66-120	100-180	127-228
Strand guide length:	800/1,200/1,500 mm			
Water flow:	15 m ³ /min	30 m ³ /min	40 m ³ /min	50 m ³ /min

* Dependent on product.

Maximum throughput [kg/h]*:				
	4,200	8,300	12,500	16,000

* depending on pellet weight and polymer

