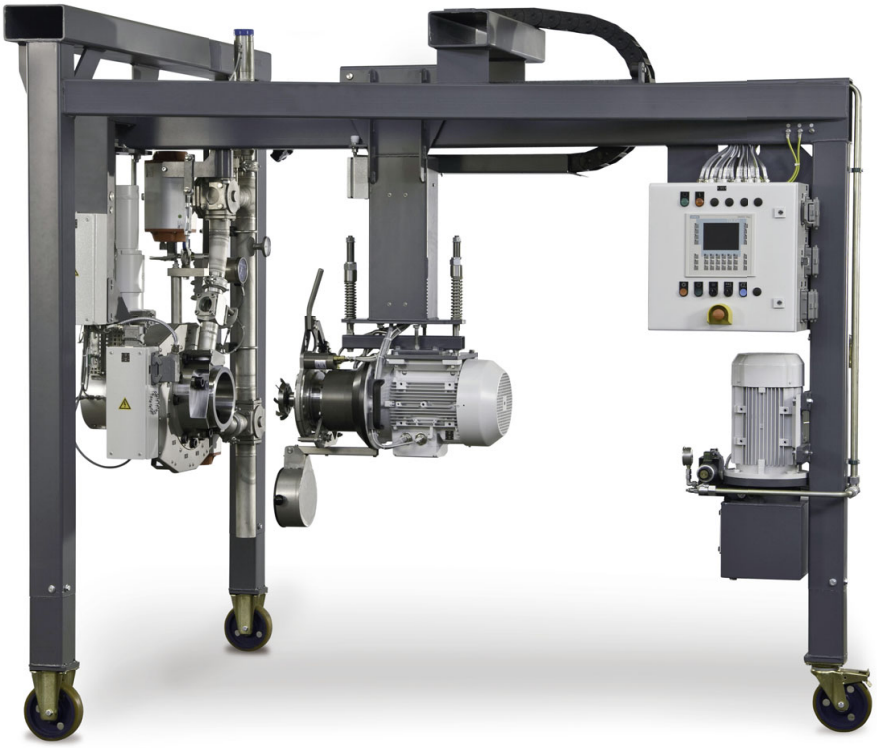
maag
Part of Pump Solutions Group

automatik
pelletizing
systems

SPHERO®

Underwater pelletizing systems for highly profitable throughput rates of up to 36,000 kg per hour



The SPHERO® underwater pelletizing system has been particularly designed to process thermoplastics and produces spherical pellets. This most flexible system is applied in the production of raw materials, compounds, masterbatches, engineering plastics, wood polymer composites, thermoplastics elastomers, hot-melt adhesives, and in the field of recycling.

Your benefits

- Outstanding pellet quality
- Increased production efficiency
- Enhanced process reliability
- Optimal access
- Convenient and safe operation
- Quick product change
- Pelletizing of specialized products

CORONA SERWIS

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SPHERO®

Functioning and applications

Processes and machines and systems made by Automatik Plastics Machinery stand for cost-effectiveness, flexibility, and reliability worldwide. With over six decades of experience and an installed base of currently more than 8,000 pelletizing systems, the company helps its customers to achieve the maximum level of profitability.

Range of applications

SPHERO® pelletizing systems are well-suited for the production of raw materials as well as for the manufacture of compounds, blends, masterbatches, and recyclates based on:

- Polyolefins, e.g. LDPE, HDPE, PP
- Styrene polymers, e.g. PS, SAN, ABS
- Acrylic resins, e.g. PMMA, PAN
- Polyacetals, e.g. POM
- Polycarbonates, e.g. PC
- Polyesters, e.g. PET, PBT, PEN
- Polyamides, e.g. PA 6, PA 6.6, PA 11, PA 12
- Thermoplastic elastomers, e.g. TPE-S, TPE-E
- Polyurethanes, e.g. TPU
- Hot-melt adhesives
- Rubber
- Natural and synthetic resins
- Biopolymers, e.g. PLA, PHA, Bio-PA, Bio-PET, Bio-PP
- Other plastics available upon request

Functioning of the SPHERO® systems

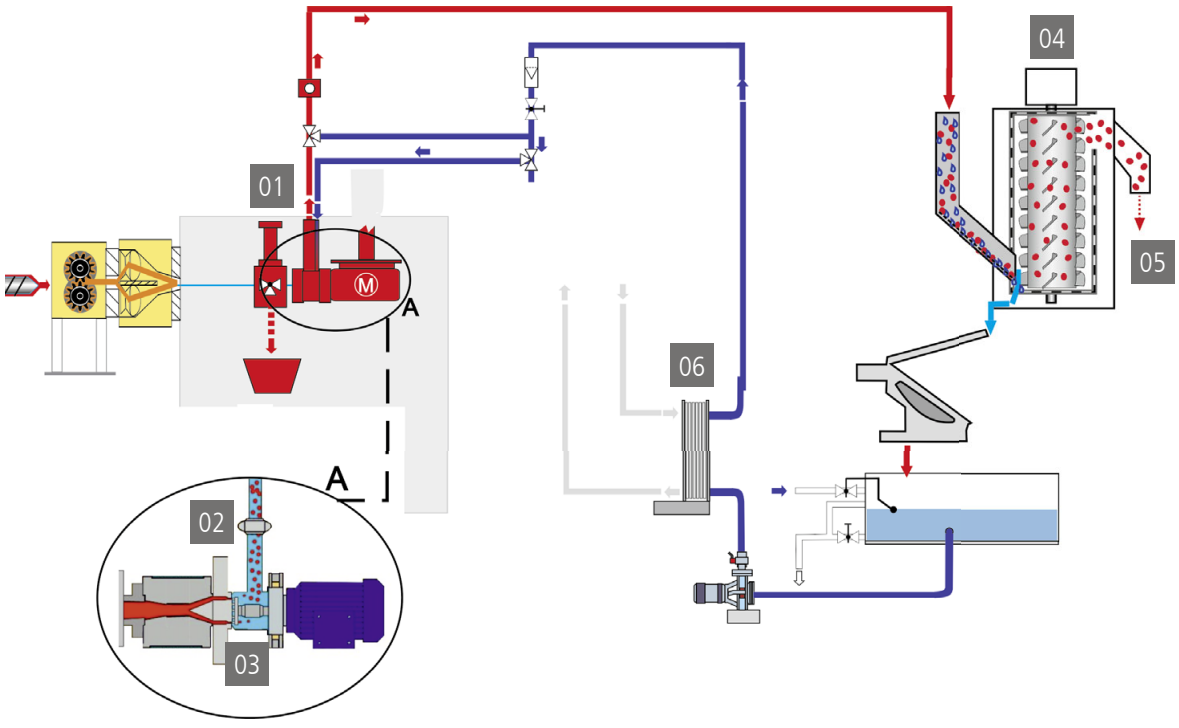
The plastic melt is conveyed in a process-controlled way to the die plate via the hydraulic start-up valve **01**.

In the heated die plate **02**, the melt is channeled into holes arranged in a ring shape and extruded into the cutting chamber **03**, which is flooded with process water.

The cutter head with the clamped knives is guided to the die plate where the polymer is cut into pellets and then conveyed to the dryer **04** by the process water.

In the dryer, the pellets are separated from the water and conveyed onward for subsequent processing **05**.

The process water is filtered, tempered, and then returned to the cutting chamber **06**.



SPHERO®

Different sizes to meet any challenge

As your most reliable and competent partner for underwater pelletizing systems, Automatic Plastics Machinery provides perfect systems for your individual requirements. In close co-operation with you, we will find solutions to increase efficiency of your pelletizing process. Our system components are highly reliable, durable, and operator-friendly and have been designed to optimize your pelletizing process.

The well thought-out frame concept with the suspended components is the most precious feature of this wide range of machinery. Various set-up options and accessories complement this process-adapted system.

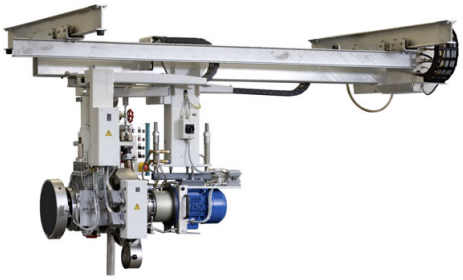
SPHERO® 50

- Ideal for lab applications and production lines with throughput rates of up to 600 kg/h for masterbatches, compounds, and recyclates
- Entire system with start-up valve and dryer including process water unit mounted on a mobile frame
- Adjustable in height to fit other plant components connected upstream
- Comfortable quick-change feature of the die plate
- Process stability due to quick and reliable start-up function

SPHERO® 50

SPHERO® 70/100/140

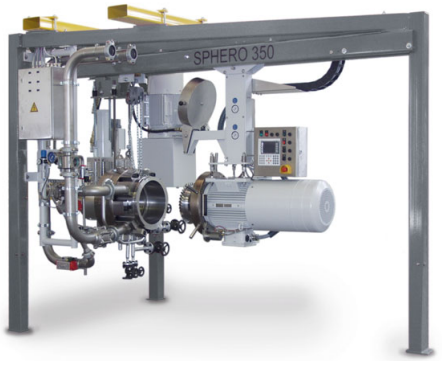
- Applicable for medium throughput rates of up to 8,600 kg/h for masterbatches, compounds, recyclates, and specialized products as well as for micro-granular compounds and glass-fiber filled compounds
- Various set-up options:
  - Mobile tripod frame with components adjustable in longitudinal direction
  - Fixed four-leg frame, components adjustable in axial and longitudinal directions, therefore open access to extruder screw
  - Suspension from the ceiling, adjustable in longitudinal and axial directions
- Plenty of space around and under the components, no rails
- Quick and reliable start-up
- Convenient change of the die plate



SPHERO® 100 Suspended version

SPHERO® 220/350/560

- Optimal solution for bulk production with throughput rates of up to 36,000 kg/h of virgin polymers, rubber, and compounds
- Process-optimized solutions for plants under continious production
- No freezing of the liquid-heated die plates
- Plenty of space around and under the components, no rails
- No rails or feeding systems laid on the floor
- Operator-friendly change of the die plate
- Vibration-free mounting of the components on the base frame
- Quick and reliable start-up



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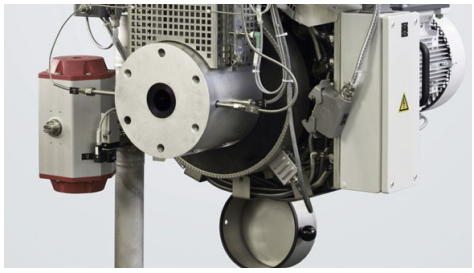
SPHERO®

SPHERO® System components

The appeal of all SPHERO® underwater pelletizing systems lies in outstandingly easy access. The suspended system components of the pelletizer enable the operator quickly, easily, and safely to operate the system.



Start-up valve

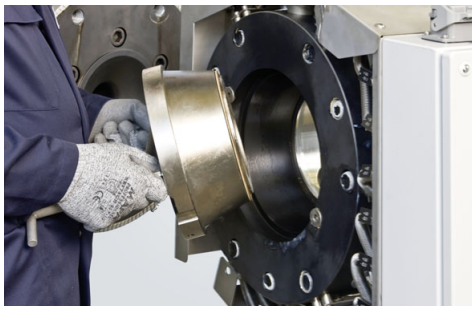
Start-up valve for process reliability

- Hydraulic activation guarantees quick and reliable start-up
- Heated and optimally designed flow channel
- Troublefree installation of a bin under the suspended valve possible
- Flexible connection to upstream components

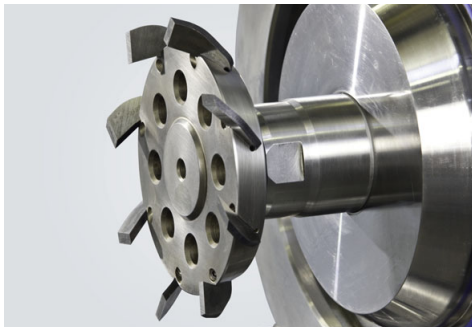
Die plate for micro pellets and die plate SPHERO® 350

Die plates optimized for every product

- Electric or liquid heating
- Thermally insulated die plate – SuperFlow featuring high energy efficiency (savings of up to 25-30%) reduces the freezing behaviour
- Operator-friendly, sealless handling
- Quick-change feature
- Visual heating zone monitoring feasible
- Die plate with special design for micro-pellets
- Optimal heating guarantees thermal continuity and uniform distribution of particle size
- Preferably applicable for EPS production



Easy replacement of the die plate



Cutter head of the SPHERO®

Cutter head – hydrodynamic

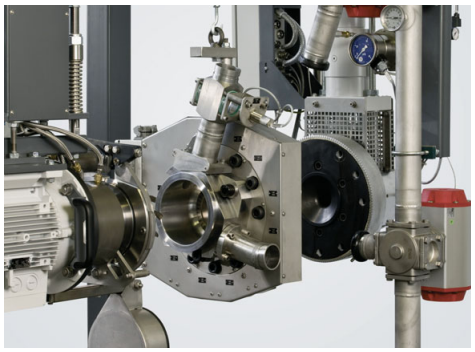
- Process-optimized approach of the cutter head to the die plate due to pneumatically adjustable knife shaft
- Direct displacement of the pellets due to the hydrodynamic design of the knives
- Dismantling/replacing the cutter head within few minutes
- No additional adjusting due to locked knives
- Optimized product flow due to countersunk mounting screws

SPHERO®

SPHERO® System components

Cutting chamber with optimized flow conditions

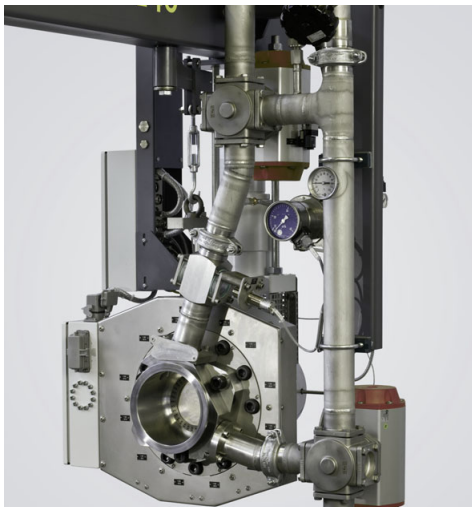
- Streamlined product flow due to tangential water supply and pellet/water drain
- Reduced pellets adherence
- No wear
- Sensor-controlled lock with comfortable single-hand activation
- Easily detachable from the start-up valve; quick-change feature of the die plate due to suspension
- Subsequent resharpening unit



Cutting chamber

Process water piping with compact feeding system

- Easily detachable connections to the cutting chamber
- Precise process water feed control through two three-way valves installed close to the cutting chamber
- Pressure monitoring reduces the risk of a blocked cutting chamber
- Visual process monitoring through sight glass
- Reliable water drainage of cutting chamber upon shutdown
- Optional extension of the cooling section feasible



Process water piping

PWS modular process water treatment

Various efficient filtration options available

- Dual, simple-to-operate drawer filter
- Curved screen
- Vibration filter sieves for extended dust and foam generation
- Band filter
- Hot-water version for high-temperature products
- Constant water temperature due to plate heat exchanger or tube-bundle heat exchanger
- Electrical or steam-based temperature control in the water tank
- Easy access to and thus easy maintenance of the water tank

PWS process water treatment system with CENTRO centrifugal dryer

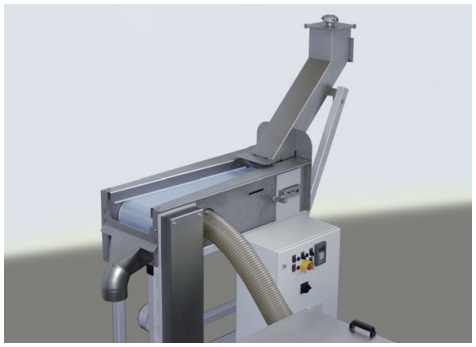
SPHERO®

SPHERO® System components

CENTRO 300 centrifugal dryer

CENTRO centrifugal dryer for energy-efficient drying

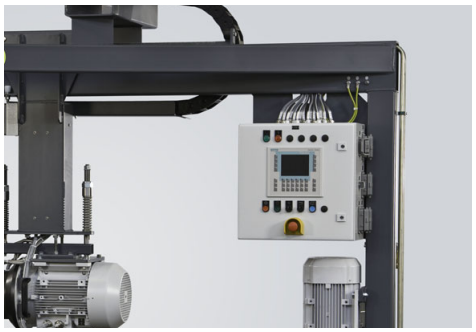
- Compact design with good access for cleaning and maintenance
- Integrated water separator
- Agglomerate separator to stabilize the process – optional
- Easily replaceable wear parts
- Low energy consumption
- Rotor speed control – optional
- Pellet guide at dryer outlet – optional
- Self-cleaning system – optional
- Special version for micro-granular compounds



DURO belt dryer

DURO belt dryer – ideal for highly filled compounds

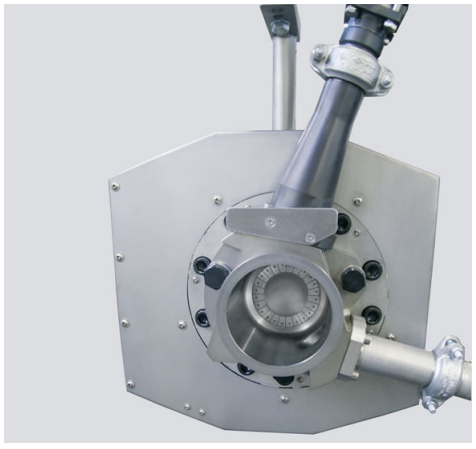
- No relative movement between the compound and the components
- High product quality due to gentle pellet handling
- Minimum generation of dust
- Low overall energy consumption as no additional energy is required
- Reduction in operating costs due to extended lifetime of the components in contact with the pellets
- Easy and quick cleaning



Machine controls

Machine control

- Simple operation of the panel directly at the controlling system
- Single-button automatic guarantees flawless, quick start-up
- The functions of all system components can be integrated into the control unit of the pelletizing system
- Data exchange with higher-level control system
- Available with process visualization feature as an option
- Combinable with OPTOdata control system



Specific-product applications require the optimal choice of components e.g. at PP, PBT, PET and PA-compounds with a content of more than 40% glass fiber

- No wear by the optimal process water stream inside the cutting chamber
- Process water treatment system equipped with components specified for hot water
- Use of wear protected parts, e.g. diverter valve, outlet of cutting chamber, piping
- Strongly reduced operational costs by use of DURO belt dryer
- Achievement of outstanding residual moisture rates and pellet temperatures suitable for packaging and transport together with a spiral conveyor

SPHERO®

Technical data

Technical data:	SPHERO® 50	SPHERO® 70	SPHERO® 100	SPHERO® 140
Diverter valve drive hydraulic unit:	3 kW	11 kW	11 kW	11 kW
Heating:	Electrical/liquid			
Drive:	3 kW	5.5 kW	7.5 kW	11 kW
Speed range:	1,500-5,000 min^{-1}	1,000-4,000 min^{-1}	1,000-3,500 min^{-1}	500-3,000 min^{-1}
Heat exchanger:	Tube/Plate heatexchanger			
Process water system:	PWS 15	PWS 25	PWS 35	PWS 45
Process water pump:	2.2 kW	4 kW	5.5 kW	7.5 kW
Process water heating (optional):	12/24 kW	24/48 kW	24/48/60 kW steam	24/48/60 kW steam
Filtration options:	Drawer filtration	Drawer filtration Belt filter Curved screen Inclined screen Vibration filter sieve	Curved screen Inclined screen Vibration filter sieve	Belt filter Curved screen Inclined screen Vibration filter sieve

Throughput rate* in kg/h:		SPHERO® 50	SPHERO® 70	SPHERO® 100	SPHERO® 140
Polymer	**Pellet weight in mg**				
PA6 n.e. 80-200 Pas:	15	350	600	1,400	2,200
PET IV 0.8:	17	350	600	1,200	2,800
PET IV 0.5:	17	350	700	1,200	2,800
R-PET IV 0.75:	25	500	1,000	1,500	2,800
PP MFI 0.2-2 (190/2.16):	20	320	480	960	1,500
PP MFI 2-200 (190/2.16):	20	360	750	1,400	2,250
PE, PVC, EPDM MFI 0.4-4 (190/2.16):	20	160	500	1,100	2,200
PE MFI 4-40 (190/2.16):	20	350	700	1,100	2,200
SB, PS, PMMA, PA:	20	400	900	1,900	2,800
PC, PC/ABS, POM:	20	400	700	1,400	2,200
PBT, PA+30-50%GF:	30	600	1,200	2,400	4,300
TPE:	20	200	450	900	1,200
TPU, HMA:	20	200	600	1,100	1,450
Polymers up to 30% mineral MFI > 4:	25	450	900	1,400	2,800
Polymers up to 70% mineral MFI > 4:	30	500	1,200	1,800	3,600
Polymers over 80% mineral MFI > 4:	35	320	900	1,500	2,800

* Throughput rates may differ depending on polymer, features and pellet size.

SPHERO®

Technical data

Technical data:	SPHERO® 220	SPHERO® 350	SPHERO® 560
Diverter valve drive hydraulic unit:	15 kW	15 kW	22 kW
Heating:	Electrical/liquid	Liquid	Liquid
Drive:	30 kW	45 kW	90 kW
Speed range:	500-2,500 min^{-1}	300-1,800 min^{-1}	250-1,000 min^{-1}
Heat exchanger:	Tube/Plate heatexchanger		
Process water system:	PWS 45/80	PWS 80/120	PWS 250
Process water pump:	15 kW	22 kW	55 kW
Process water heating (optional):	48/60 kW steam	48/60 kW steam	90 kW steam
Filtration options:	Belt filter, curved screen, vibration filter sieve		

Throughput rate* in kg/h:		SPHERO® 220	SPHERO® 350	SPHERO® 560
Polymer	**Pellet weight in mg**			
PA6 n,e, 80-200 Pas:	15	5,700	9,000	21,000
PET IV 0.8:	17	7,600	9,000	30,000
PET IV 0.5:	17	8,000	12,000	36,000
R-PET IV 0.75:	25	**	**	**
PP MFI 0.2-2 (190/2.16):	20	5,700	9,000	14,000
PP MFI 2-200 (190/2.16):	20	7,600	12,000	21,000
PE, PVC, EPDM MFI 0.4-4 (190/2.16):	20	4,300	6,500	**
PE MFI 4-40 (190/2.16):	20	5,700	9,000	**
SB, PS, PMMA, PA:	20	7,600	12,000	**
PC, PC/ABS, POM:	20	5,700	9,000	**
PA+30-50%GF, PBT:	30	11,400	**	**
TPE:	20	**	**	**
TPU, HMA:	20	3,600	**	**
Polymers up to 30% mineral MFI > 4:	25	7,600	120,000	**
Polymers up to 70% mineral MFI > 4:	30	9,500	15,000	**
Polymers over 80% mineral MFI > 4:	35	5,800	**	**

* Throughput rates may differ depending on polymer, features and pellet size.

** On request.

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