



MINICOLOR V MINICOLOR G GRAVICOLOR

Dosing and mixing units

Excellent mixing quality with highest repeatability are demanding requirements when dosing additives and regrind directly on the processing machine. Motan MINICOLOR and GRAVICOLOR dosing and mixing units meet these requirements to a high degree.

The MINICOLOR and GRAVICOLOR series are specially designed for injection moulding and extrusion. Innovative design, high quality engineering and technical specifications, guarantee optimum performance and reliability of the units.





smart solutions, is an additional range of equipment for optimising and automating the production around plastics processing machines.

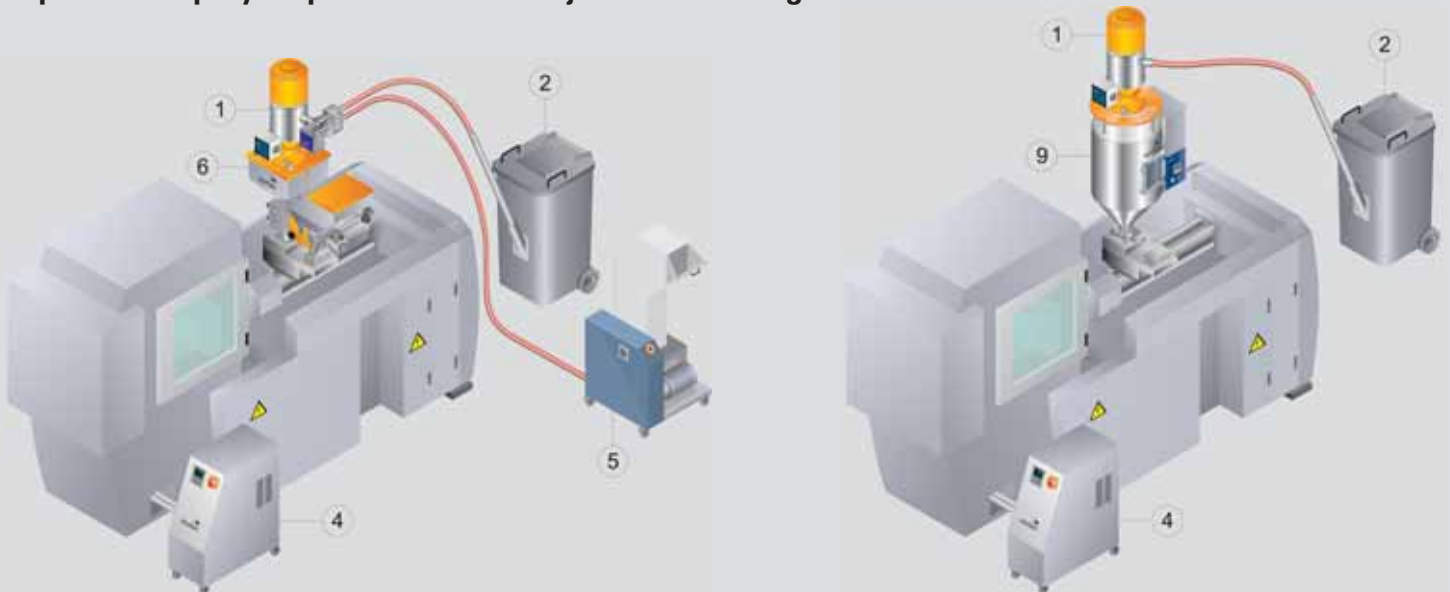
smart solutions: to increase productivity with the least capital expenditure.

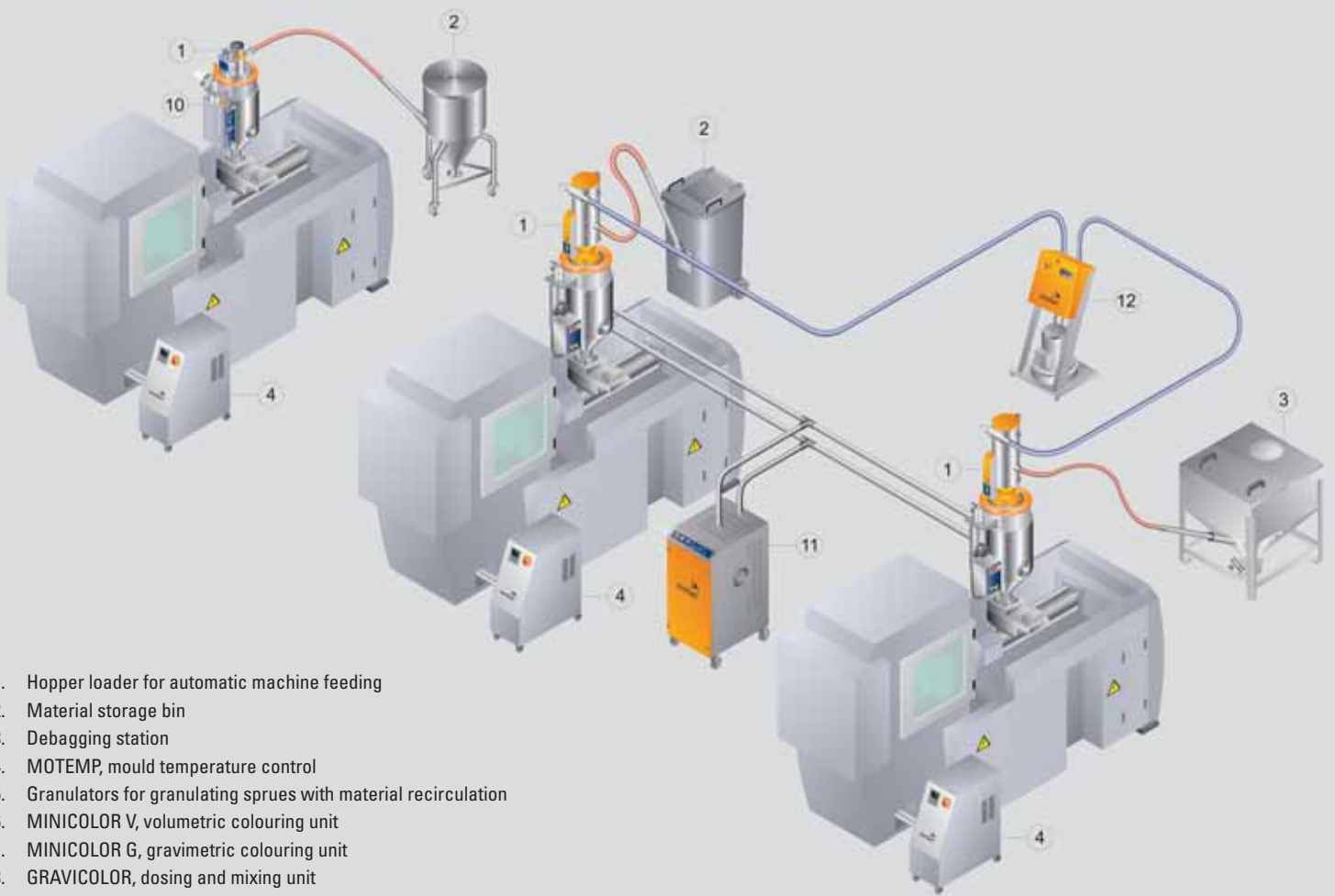
All units can be combined or expanded in order to satisfy increasing and changing requirements. **smart solutions** help the plastics processor to equip their individual machines or production cells. In the case of injection moulding, extrusion or blow moulding machines, cost savings can be easily achieved with minimum outlay.

Individual applications and problems are rapidly solved and may be the first steps towards a later system solution. **smart solutions** correspond to Motan's high quality standard in spite of lower prices and are available through Motan's worldwide distribution and service network. All units may of course be integrated into system solutions.

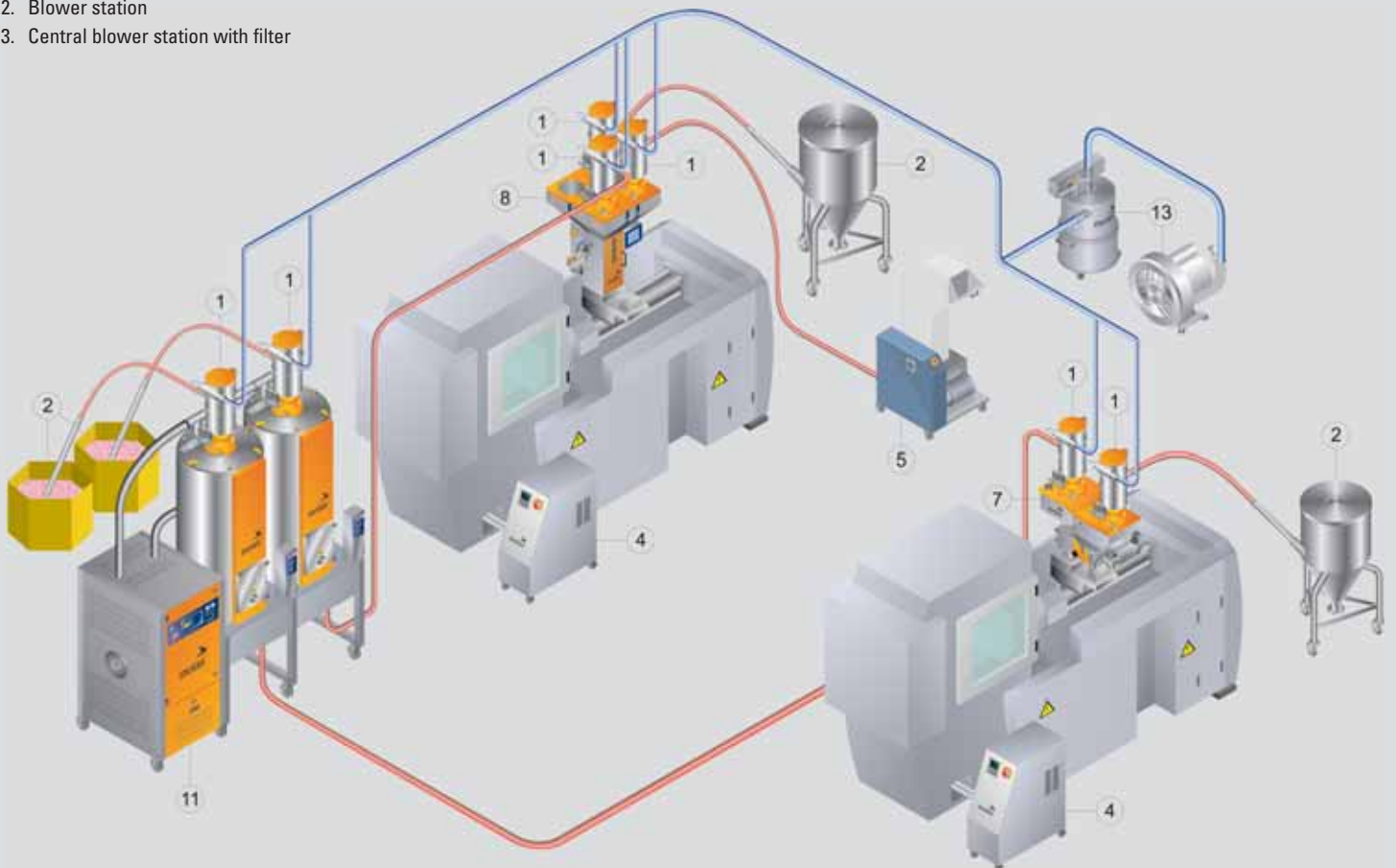
- Material bins for clean and clearly arranged material storage
- Dryers for energy saving material drying to a defined residual moisture, or removing surface moisture and preheating of material
- Conveying equipment for automatic material transport and supply to the machine
- Dosing and mixing units for self colouring or addition of additives and regrind
- Mobile granulators for sprues and rejects as well as the introduction of regrind to the material flow
- Temperature control units to maintain the temperature for optimum conditioning of injection moulds

Examples for step-by-step automation of injection moulding machines.





1. Hopper loader for automatic machine feeding
2. Material storage bin
3. Debagging station
4. MOTEMP, mould temperature control
5. Granulators for granulating sprues with material recirculation
6. MINICOLOR V, volumetric colouring unit
7. MINICOLOR G, gravimetric colouring unit
8. GRAVICOLOR, dosing and mixing unit
9. LUXOR HD, hot air dryer
10. LUXOR CA, compressed air dryer
11. LUXOR, dry air dryer
12. Blower station
13. Central blower station with filter





General view of all dosing and mixing units

	MINICOLOR V*	MINICOLOR G S*	MINICOLOR G A*	GRAVICOLOR 60	GRAVICOLOR 100	GRAVICOLOR 30 MD
Dosing system	volumetric	gravimetric	gravimetric	gravimetric	gravimetric	gravimetric
Number of possible dosing heads	2	1	2	4	4	4
Dosing range main component				1 - 100%	1 - 100%	1 - 100%
Dosing range additive with dosing screw G1, lbs (kg)	0.3 - 5.5 (0.15 - 2.5)	0.3 - 5.5 (0.15 - 2.5)	0.3 - 5.5 (0.15 - 2.5)	0.5 - 10%	0.3 - 10%	0.1 - 10%
Dosing range additive with dosing screw G2, lbs (kg)	3 - 44 (1.4 - 20)	3 - 44 (1.4 - 20)	3 - 44 (1.4 - 20)			
Dosing range additive with dosing screw G3, lbs (kg)	6 - 60 (2.7 - 27)	6 - 60 (2.7 - 27)	6 - 60 (2.7 - 27)			
Most cost effective solution for colouring of masterbatch	●					
Most cost effective solution for automatic calibration		●				
Most cost effective solution for weighing all components				●		
Additive dosing and mixing unit (e.g. masterbatch)	●	●	●			
Automatic calibration		●	●	●	●	●
Recipe management		●	●	●	●	●
Accumulated dosing throughput		●	●	●	●	●
Process documentation (throughput acquisition etc.)			●	●	●	●
Can be networked (Ethernet)			●	●	●	●
Additives and main components are dosed				●	●	●
IntelliBlend for highest dosing and mixing accuracy				●	●	●
Micro dosing for minimum quantities						●

* Processes also extruder tachometer signal.



MINICOLOR V MINICOLOR VL Dosing and mixing unit

The demand for an excellent mixing quality and consistently accurate dosing are a must when combining additives with the virgin material at the processing machine.

The volumetric dosing and blending unit MINICOLOR V meets and exceeds these requirements. Mounted between the machine hopper and the feed throat of the plastics processing machine it requires very little space.

A stainless steel cruciform in the mixing throat divides the main component into two streams of material. They flow together with the additives at the feed inlet producing a homogeneous mixture.

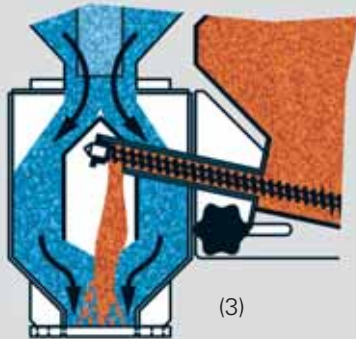
The optional MINICOLOR VL, a small compressed air loader, can be used to fill the additive hopper quickly.



MINICOLOR VL (Fig. 1)

The Venturi loader can be used for the automatic filling of the additive hopper with granulate. A level sensor signals the need for material and ensures that the hopper never runs empty. The MINICOLOR VL is installed by replacing the additive hopper lid and can easily be retro-fitted.

(2)



Mounting flange (Fig. 2)

The mounting flange is designed so that it can easily be mounted on different sized feed throats (min. 2.9in max 3.5in) without the need for drilling.

Mixing neck (Fig. 3)

The mixing cruciform is made of stainless steel. It separates the main material from the additives until they meet just above the throat of the processing machine. They then flow together, resulting in an optimum mix with no material separation.

Dosing (Fig. 4)

The special angled dosing head eliminates material trickle. There are three different sizes of wear resistant dosing screws available and they can be removed without the use of tools. During calibration the dosing head can be withdrawn in order to collect and weigh the additive sample.



Controls

There are two types of controls available, and dosing can be either continuous for extrusion applications or during screw-back time for injection machines. In conjunction with the brushless motor and control, the MINICOLOR V offers one of the most consistent and repeatable dosing rates on the market today.

MINICOLOR S (Fig. 5)

The standard control for either one or two dosing heads is available with or without timer.



COLOR A (Fig. 6)

The innovative microprocessor control is designed for optimum performance, simplicity of use and offers:

- four selectable material types for up to two dosing units
- recipe management
- "plug and play" easy to use and no manual required for start-up
- adjustable low material level alarm
- multiple external signal input/output options



(6)



MINICOLOR G S



Compact gravimetric dosing and mixing unit for one main component and one masterbatch or additive in granular form suitable for injection moulding machines, extruders and blow moulding machines. With the GRAVInet MC control up to two dosing heads can be operated.

The unit is based on the well tried MINICOLOR concept with gravity mixing funnel guaranteeing a homogeneous material mix and eliminating separation.

The dosing station for masterbatch or additive sits on a robust but extremely precise load-cell and



GRAVI S control

- Separate microprocessor control with membrane keyboard and 9ft connection cable to the mixing unit MINICOLOR G S. Thus, no thermal influence. User friendly location possible.
- Colour or additive rate is simply entered as percentage.
- 5-digit-display with symbols for the various operational states.
- Potential-free alarm output and external signal input (external contact) for the dosing cycle.
- Connection of hopper loaders for automatic filling of the additive storage bins.
- Storage of 10 recipes possible.
- Display of the additive throughput.
- At power failure, recipe and unit data are buffered and not lost.

MINICOLOR G A

operates using loss-in-weight metering technology. This offers operational security for high level requirements.

MINICOLOR G A enables easy addition of regrind. Due to automatic calibration, the commissioning time is extremely short.

The MINICOLOR G is insensitive to vibrations and is specially designed for mounting directly onto the feed throat of the processing machine.



Load-cell

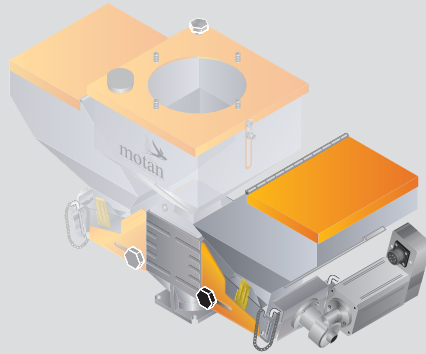
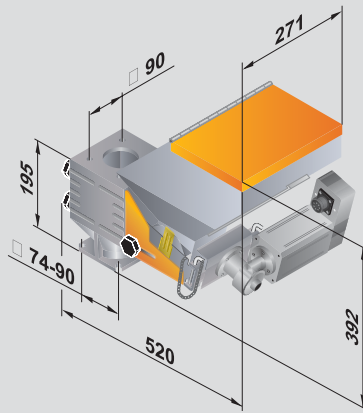
GRAVInet MC control

- Separate control with 9ft connection cable to the mixing unit MINICOLOR G A. Thus no thermal influence. User-friendly location possible.
- Easy handling through colour graphic display with touch-screen and image guided operator interface.
- Potential-free alarm output and external signal input (external contact) for the dosing cycle.
- Storage of up to 50 recipes possible.
- Detailed report function via ethernet.
- Automatic adjustment of the masterbatch dosing depending on the regrind percentage.
- Unit with two dosing heads enables fast colour change.





MINICOLOR



Technical Data	MINICOLOR V	
Number of dosing stations	1 or 2	
Dosing capacity*	dosing motor i = 55:1	dosing motor i = 30:1
G1S, lbs/h (kg/h)	0.2 - 3.3 (0.1 - 1.5)	0.3 - 5.5 (0.15 - 2.5)
G2S, lbs/h (kg/h)	1.5 - 26 (0.7 - 12)	3 - 44 (1.4 - 20)
G3S, lbs/h (kg/h)	3.3 - 44 (1.5 - 20)	6 - 60 (2.7 - 27)
Volume of storage hopper (lbs/l)	12	
Control unit	MINICOLOR S and COLOR A	
External contact	potential-free	
Connected load, W	150	
Power supply 1/N/PE (V/Hz)	120/60	
Weight approx., lbs (kg)	33 (15) without control	

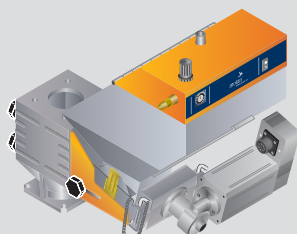
* Varies with bulk density. Indicated values for masterbatch: bulk density = 50lbs/cu ft (0.8kg/dm³).

Technical Data	MINICOLOR G	
Number of dosing stations	1 or 2	
Dosing capacity*	dosing motor i = 55:1	dosing motor i = 30:1
G1S, lbs/h (kg/h)	0.2 - 3.3 (0.1 - 1.5)	0.3 - 5.5 (0.15 - 2.5)
G2S, lbs/h (kg/h)	1.5 - 26 (0.7 - 12)	3 - 44 (1.4 - 20)
G3S, lbs/h (kg/h)	3.3 - 44 (1.5 - 20)	6 - 60 (2.7 - 27)
Volume of storage hopper (lbs/l)	12	
Control unit	GRAVI S and GRAVInet MC	
External contact	potential-free	
Connected load, W	150	
Power supply 1/N/PE (V/Hz)	120/60	
Weight approx., lbs (kg)	35 (16) without control	

* Varies with bulk density. Indicated values for masterbatch: bulk density = 50lbs/cu ft (0.8kg/dm³).

MINICOLOR VL

Technical Data	MINICOLOR VL
Conveying capacity, lbs/h (kg/h)	max. 66 (30)
Mode of conveying	Compressed air
Compressed air supply, psi (bar)	60 - 100 (4 - 10)
Air consumption, cfm (m ³ /h)	max. 6 (10)
Power supply 1/N/PE (V/Hz)	120/60
Weight approx. lbs (kg)	9 (4)



Subject to technical changes.

MINICOLOR V MINICOLOR G

Your benefits

- Infinitely variable dosing quantity
- Wear resistant dosing screw
- Fast and easy to clean

Cost savings through

- no warehousing of pre-coloured material
- fast material changes for masterbatch
- minimal additive usage
- maintenance free dosing motor (not MINICOLOR G S)

Production reliability through

- inclined dosing screw (no material trickle)

Additional benefits for MINICOLOR G

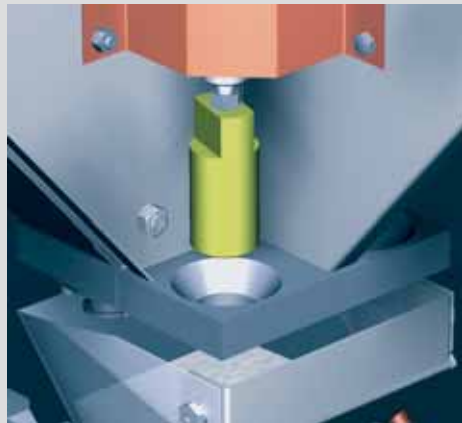
- Highest dosing reliability through loss-in-weight technology
- Recipe management
- Acquisition of throughput rates
- Simple operation

Cost savings through

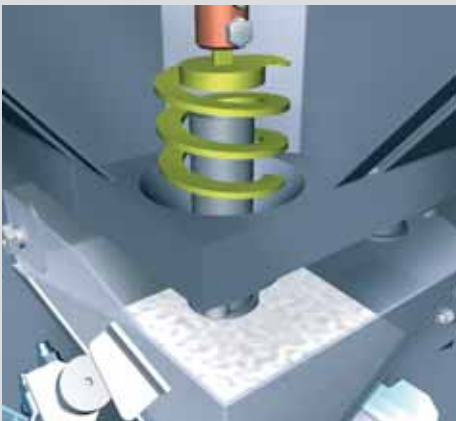
- automatic calibration
- potential savings with masterbatch and additives
- automatic monitoring of the dosing throughput and adjustment to changing bulk densities



GRAVICOLOR 30 MD



Cone-dosing



Micro-dosing GRAVICOLOR 30 MD

GRAVICOLOR

Gravimetric dosing and mixing units

Motan's GRAVICOLOR units mix and blend up to four or six materials precisely and with maximum accuracy of blend. These modular gravimetric blenders are designed for injection, blow molding and extrusion and provide throughputs up to 4,850lbs/h.

Independent of recipes, materials or the operational environment, IntelliBlend analyses all process data achieving the best possible operating point at any time through continuous self-optimisation. Recipe integrity results in an excellent and consistent product quality.

The GRAVICOLOR series forms part of the total Motan range of products and systems for all stages of the management, conditioning and preparation of plastic granules. Build quality plus the engineering and service standards which Motan applies to all parts of its operation ensure high performance and reliable operation.

Dosing

Except for the additive micro-dosing on the GRAVICOLOR 30 MD, all component materials are metered by the unique Motan cone-dosing system. This dosing system ensures that a high total material throughput can be achieved, even when metering a large number of additives.

On the GRAVICOLOR 30 MD, additives or masterbatch are metered by an innovative and highly accurate micro-dosing unit. The additive is dosed into the weigh bin using a vertically aligned feed-screw.



Material storage bin

The stainless steel storage bins are of modular design and available in several different sizes. Some can be removed and all are easily accessible for cleaning. The design features provide optimum flexibility for processing different materials.

Conveying

All GRAVICOLOR units can optionally be equipped with an integrated conveying control which allows the control of up to seven hopper loaders with a blower station; i.e. material handling for a 4-component mixing station with processing machine can, for example, be controlled and operated directly via the GRAVICOLOR.

For the installation of complex systems there is the possibility of networking several GRAVICOLOR units with each other or with other Motan controls of the CONTROLnet family. This guarantees a high degree of flexibility.

Installation

GRAVICOLOR units can either be mounted on the processing machine or operated as a central mixing station. In the latter case, an optional support frame with hopper and suction box is available.

Monitoring

Large sight glasses in the storage bins and the front door of the units allow visual control of the entire dosing and mixing process.

GRAVireport (optional)

With this PC program process data of up to 252 GRAVICOLOR units can be captured and evaluated via Ethernet.

Mixing chamber

The specially developed mixing chamber guarantees total homogenisation of the batches.



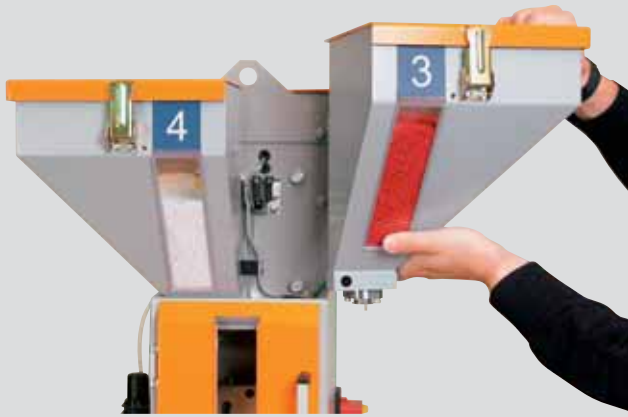
GRAVICOLOR 60



GRAVICOLOR 100



GRAVICOLOR



GRAVICOLOR 30 MD

Cleaning and material changes

Fast material changes require easy access to all parts in contact with the material, to ensure efficient cleaning. Hinged lids and large, removable sight glasses or demountable storage bins enable complete and thorough cleaning of the bins.

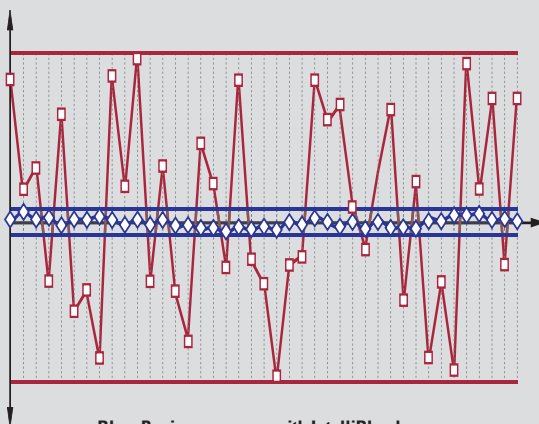
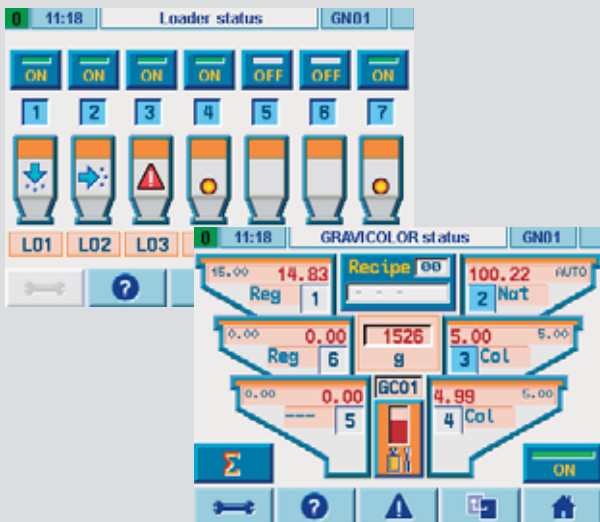
Material changes are facilitated and simplified by the large front door, the removable weigh bin and the easily accessible mixing chamber.

All GRAVICOLOR parts in contact with material are made of stainless steel, preventing contamination of the granulate.

GRAVInet control

The operating unit can either be mounted on the GRAVICOLOR or operated remotely. In addition, integrated Ethernet technology enables operation via a Motan WEBpanel or a PC from any location. Further characteristics are:

- colour graphics display with touch-screen operation,
- simple intuitive handling via standardised user interface,
- powerful and accurate process control with IntelliBlend, continuous self-optimisation and sophisticated vibration management,
- detailed report and print functions via network or serial interfaces,
- integrated network interface (Ethernet) as well as Internet technology,
- integrated conveying control (optional),
- recipe management,
- possibility to set up coupled line systems (optional),
- LINKnet interface for visualisation (optional).



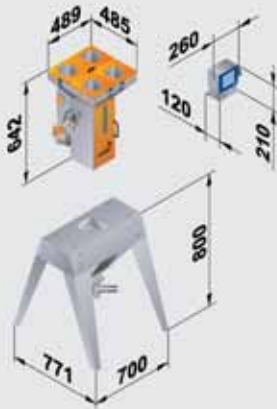
Blue: Recipe accuracy with IntelliBlend
Red: Recipe accuracy without IntelliBlend

Recipe accuracy through IntelliBlend

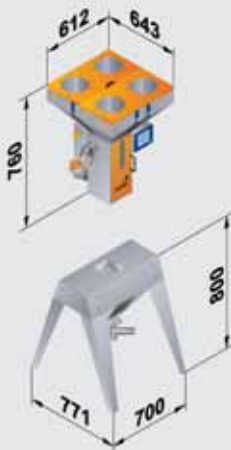
This dosing system ensures a high total material throughput, even when metering large quantities of additives. Since each component is weighed individually and using IntelliBlend, an extraordinary recipe accuracy is achieved.



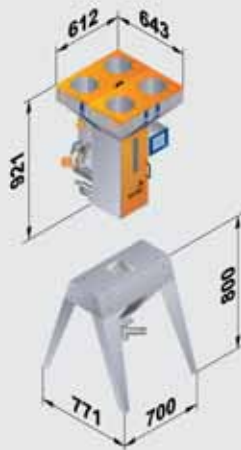
GRAVICOLOR 30 MD



GRAVICOLOR 60



GRAVICOLOR 100



All dimensions in mm.

Technical data GRAVICOLOR	30 MD	60	100
Standard number of dosing stations	4	4	4
Average throughput, lbs/h (kg/h)	130 (60)	200 (90)	330 (150)
Dosing range per main component (%)	1 - 100	1 - 100	1 - 100
Dosing range per additive (%)	0.1 - 10	0.5 - 10	0.3 - 10
Volume of hopper for main component, lbs/liter	7	18	18
Volume of hopper for additive, lbs/liter	7	18	18
Power supply 1/N/PE (V/Hz)	115/60	115/60	115/60
Connected load, W	100	100	300
Protection class	IP 54/42	IP 54/42	IP 54/42
Compressed air, psi (bar)	87 - 116 (6 - 8)	87 - 116 (6 - 8)	87 - 116 (6 - 8)
Weight without support frame approx., lbs (kg)	130 (60)	155 (70)	175 (80)

Subject to technical changes.

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GRAVICOLOR

Your benefits

- Documented production process (report and print function via Ethernet or serial interface)
- Simple operation through colour graphic display with touch-screen – no programming necessary
- Regrind management
- Integrated network connection (Ethernet) as standard

Cost savings through

- guaranteeing recipe integrity and lowest possible additive consumption using IntelliBlend
- high productivity and consistent product quality
- small space requirement
- fast and easy cleaning
- fast and easy material change
- regrind management, preventing an overdose of other components
- versatile operation (central mixing unit or machine mounted unit)
- integrated conveying control (option)

Production reliability through

- continuous self-optimisation by set/ actual comparison
- maximum repeatability and extraordinary recipe accuracy through IntelliBlend



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