

## MC-12 Economy product information



Color in Control



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# The dosing principle

Many applications for additives and colors require low and even more important: repeatable – dosage levels. Either the percentage to be added might be low, or the process just has a low throughput. Maintaining an accurate, steady and repeatable dosing rate at low dosages can be difficult. In some cases the process might dictate a low level of master batch, as in the case of tinted PET bottles where dosing rates as low as 0.05% are sometimes required.

Movacolor has developed a revolutionary dosing device that ensures a regular and repeatable output and also creates a wide range of application options, the Movacolor Dosing Cylinder®. From the outside it may look like a screw but, in fact, it is a cylinder. It ensures that colorant literally lines up granular by granular before it enters the main stream of material.

Particularly with low output, substantial savings on colorants are possible when a Dosing Cylinder® is used. See Fig. 1.

Fig. 1 compares the Movacolor Dosing Cylinder® to a screw. A screw-type dosing device will give an irregular output because of pulsations created by the screw itself, which causes the colorant to be dosed irregularly into the main material.

A Dosing Cylinder® guarantees accurate dosing. The Dosing Cylinder® works in combination with a stepper motor that ensures exact cylinder speed i.e. colorant dosing speed.

With a Dosing Cylinder® and stepper motor you achieve:

- An even dosing rate because peaks and drops associated with screw-type dosers are eliminated, depending on the material used, of course.
- Accurate and stable dosing because of the ability of the stepper motor to maintain a controllable speed within 0.1 rpm.
- Repeatability because of the stepper motor control.
- Versatility to run higher speeds for higher dosages.

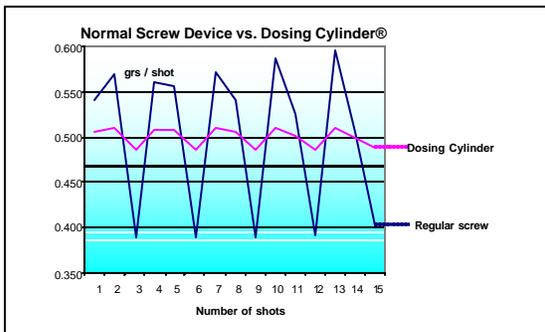
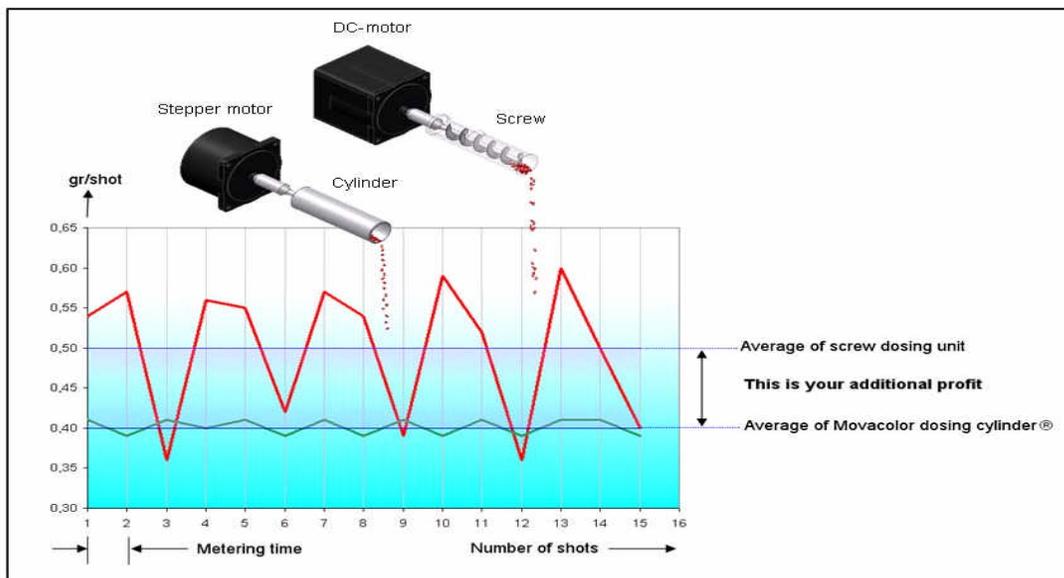


Fig 1. Actual dosing pattern of a normal screw-type dosing device versus a Dosing Cylinder®. Both tests were performed under identical circumstances, using the same material.

Colorants are expensive. Savings on colorants are often substantial savings. With its outstanding control of the dosing process, the Movacolor Dosing Cylinder® does just that!

The Dosing Cylinder® and the stepper motor play a significant role in the dosing process. The neckpiece, on the other hand, is of great importance as well in terms of how the colorant reaches the main material. It is important that the regular output is not disturbed anywhere in the process and dosed directly into the main stream.

Fig 2. Consistent metering allows the set point to be lowered. This will ensure substantially faster return on investment.



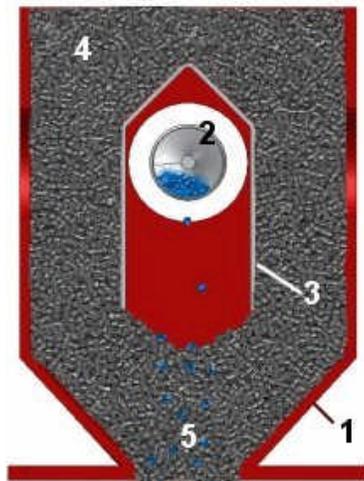


Fig. 3

- 1. Neckpiece 2. Dosing cylinder 3. Cover plate
- 4. Virgin material 5. To production machine

#### Standard neckpiece

During operation, the virgin material runs from the machine hopper through the neckpiece into the machine. Inside the neckpiece the virgin material flow is divided into two streams by the cover plate. In the space below the cover plate, the rotating cylinder is dosing additive.

Additive is added directly into the center of the virgin material flow, just before it enters the production machine. This is a great advantage over metering devices that use batch pre-mixing because pre-mixing can actually cause material separation. Separation of materials results in an irregular additive flow into the production machine.

#### PET neckpiece

PET enters the neckpiece through the inlet pipe. Any overpressure is relieved through the two air vents next to the PET inlet pipe. The pressure drop created in the volume around the inlet pipe will allow any dust particles to settle before the air escapes through the air vents.

The PET stream is separated around the water-cooled insert with a no dead spots design so no material can settle. Mixing of the MB with the PET will take place directly under this insert. The inside of the PET neckpiece is self-cleaning which makes color changes substantially faster and easier.

#### Special neckpieces

Customer-specific neckpieces will be made on request. Movacolor has a wide range of mounting set-ups available in its CAD database



MC-Balance + NST 40 neckpiece + quick calibration slide



IC-12 + PET Neckpiece. Throughput of main material up to 750 kg/hr



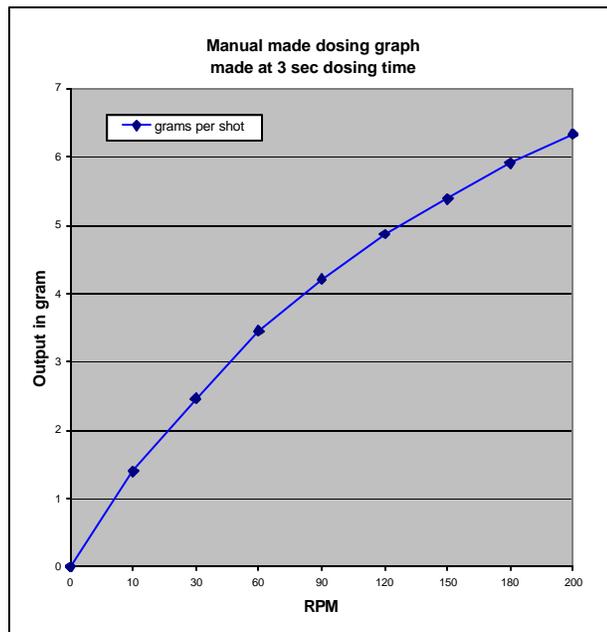
MC-12 + PET neckpiece. Throughput of main material up to 2000 kg/hr

# Volumetric Single-Component series

## Calibrating the MC-12

### How it works

Determine the dosing unit rpm entirely manually. This can be done by drawing up the dosing characteristic manually, or by recording the relation of the rpm versus the system output in a chart. With this multipoint chart, it is possible to determine the rpm that corresponds to the dose amount. This must be repeated for every dosing setting because the dosing conditions and the materials used are usually very different.



# Movacolor MC -12 Economy

## General

MC-12 controls were designed to set metering speed and metering time manually. The unit also works in relay mode for extrusion applications. Unlike the MC-18 the MC-12 features manual voltage adjustment in combination with a standard 115/230 VAC transformer.

## Calibration Method/Controls

The required metering system rpm needs to be tested by manual deduction. When testing off-line the TEST button will run the unit at the set parameters. The measured value needs to be re-evaluated with the required set point. When required metering speed must be adjusted. This procedure is repeated until the required set point is achieved.



## Controls

Speed: Manual setting from 0 to 200 rpm max, in increments of 0.1 rpm.  
 Time: Manual setting from 0 to 999 sec in increments of 0.1 sec.  
 Keyboard lock: 1 level.

## Monitoring/System Information/

### External communication

4-piece 7 segments LED at front display.  
 Man/machine interface: keypad.  
 External communication: none.  
 Alarm: LED indication.



## Output Ranges

Dosing system	Dosing capacity gram/sec	Dosing capacity Kg/hour
Type GL*	0.02 to 0.4	0.07 to 1.44
Type G*	0.2 to 7	0.72 to 25.2

Note\* measured with granular masterbatch 0.8 kg/dm<sup>3</sup>

## Specifications/Standards & Directives

### Technical data:

Manual mains power selector 110/230 VAC 50 – 60 Hz.  
 Power consumed 50 Watt.  
 Stepper motor (1.8 degr/step) max 2 Amp at 40 Volt.  
 Operating Temperature: -20 to + 70 degr. C.

### Input signal(s):

**Injection molding:** Start/stop trigger input, potential free or 0-24 VDC.

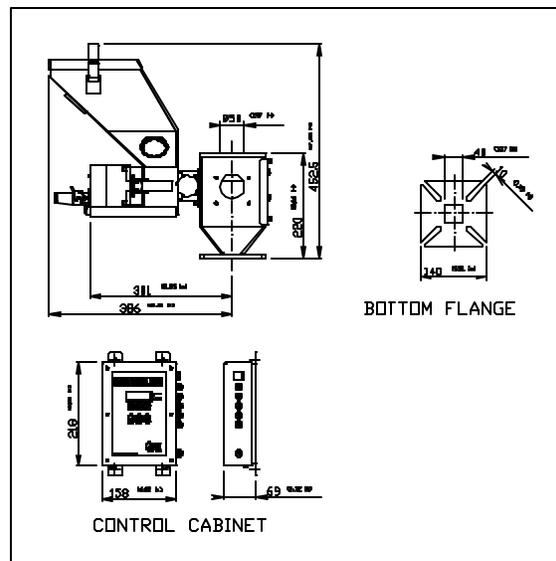
**Extrusion:** Start/stop trigger input, potential free or 0-24 VDC.

### Output(s):

- Stepper motor max output 2 A (40 VDC).

### Standards and Directives:

Protection class: IP -50.  
 According to CE standards:  
 EN50081-2 (HF radiation industry).  
 EN50082-2 (HF immunity industry).



**Safety**

- In case of overload due to short-circuit or incorrect connection, the power supply automatically shuts down.
- Opto insulated start input for connection to production machine.

**Machine connection flanges**

Standard flange NST40 with cleaning opening and inlet/outlet

Ø 50mm/ ? 40mm, steel epoxy coated.

Flange type NST90 with cleaning opening and inlet/outlet

Ø 50mm/ ? 90mm, steel epoxy coated.

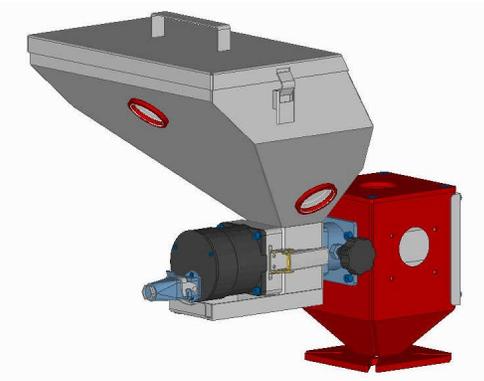
Water-cooled flange NBH(A) inlet/outlet 50 mm/50 mm, stainless steel ANSI 304.

Water-cooled flange NPHA inlet/outlet 100 mm/100 mm, stainless steel ANSI 304.

Other flange types custom-made on request.

**Accessories**

12 liter hopper, H2O PET neckpiece for throughput of main material < 2000 kg/hr.



12 liter hopper



H2O PET neckpiece for throughput of main material < 2000 kg/hr