



# CIRCULAR ECONOMY



# WHAT IS A CIRCULAR ECONOMY

## HOW PLASTICS ARE RECYCLED

Today's world would not be possible without plastics for very many reasons. Polymers are used in the most diverse applications: for household appliances, automotive and aircraft manufacturing, in electronics, in the medical field and the construction sector. They are nearly indispensable for packaging materials, which contribute greatly to resource efficiency by functioning as insulation or a light building material and thereby reducing heating oil and fuel consumption, or by extending the shelf life of food stuffs as packaging material.

FORECAST

1,124 MT\*

PLASTICS PRODUCED  
GLOBALLY

PLASTIC PACKAGING  
TODAY OVER

80 MT

PRODUCED YEARLY

PLASTIC WASTE

14%\*

COLLECTED  
FOR RECYCLING

### LIMITED RESOURCES

Plastic waste has become a global problem that affects us all and needs to be solved by society as a whole. In addition, there is also the problem of an ever-increasing demand for resources that are already scarce: many resources are limited and as the global population continues to grow, the demand for these resources is also steadily increasing. This is why the circular economy is an important topic for the plastics industry.

### RECYCLING

Plastics have ideal properties for recycling. However, a requirement for a functioning circular economy is that all actors along the entire supply chain must work together and communicate with each other. For the plastics industry (plastics manufacturers, plastics processors, and plastics recyclers) this also applies to their customers and distributors, who influence the product design and the possibility of using a recycled material with their requirements and material specifications.

### INDUSTRY 4.0

motan works in three plastics sub-areas: the manufacture of virgin materials and recycled materials as well as plastic processing. The success of a circular economy will depend on transparency, i.e. what exactly a product consists of and where this product is going. Digitalisation enables the networking of production data and can help to create this transparency.

» THE SUCCESS OF CIRCULAR ECONOMY  
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WHAT EXACTLY A PRODUCT CONSISTS OF  
AND WHERE THIS PRODUCT IS GOING.«

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**»FOR A SUCCESSFUL CIRCULAR ECONOMY,  
EVERYONE NEEDS TO CONTRIBUTE  
IN THEIR ROLE AS A CONSUMER.«**

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### **ENVIRONMENTAL PROBLEMS**

Plastics are produced from organic resources but are not normally biodegradable. A plastic bottle breaks down to microplastic particles in about 450 years in. Due to economic interests, a lack of education and weak recycling systems, millions of tons of plastic waste per year end up in our environment. These problems must be eliminated and at the same time alternatives for plastics such as bioplastics sought.



# CIRCULAR ECONOMY

## THE THREE LIFECYCLES OF PLASTICS

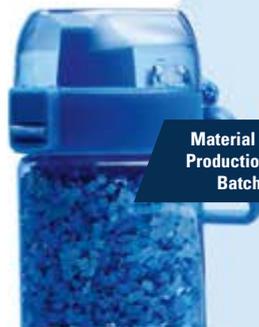
From our perspective, the circular economy in the plastics industry consists of three cycles:

- Plastics production
- Plastics processing
- Plastics recycling

Our goal is to strengthen and continuously expand the third cycle. We want to maximize the value of products and components at the end of their life. The circular economy as an integrated approach is essential. For example, it considers the recyclability of products already in the design phase. For this, we are also focusing intensively on the digitalization of our systems and solutions – generally referred to as Industry 4.0.

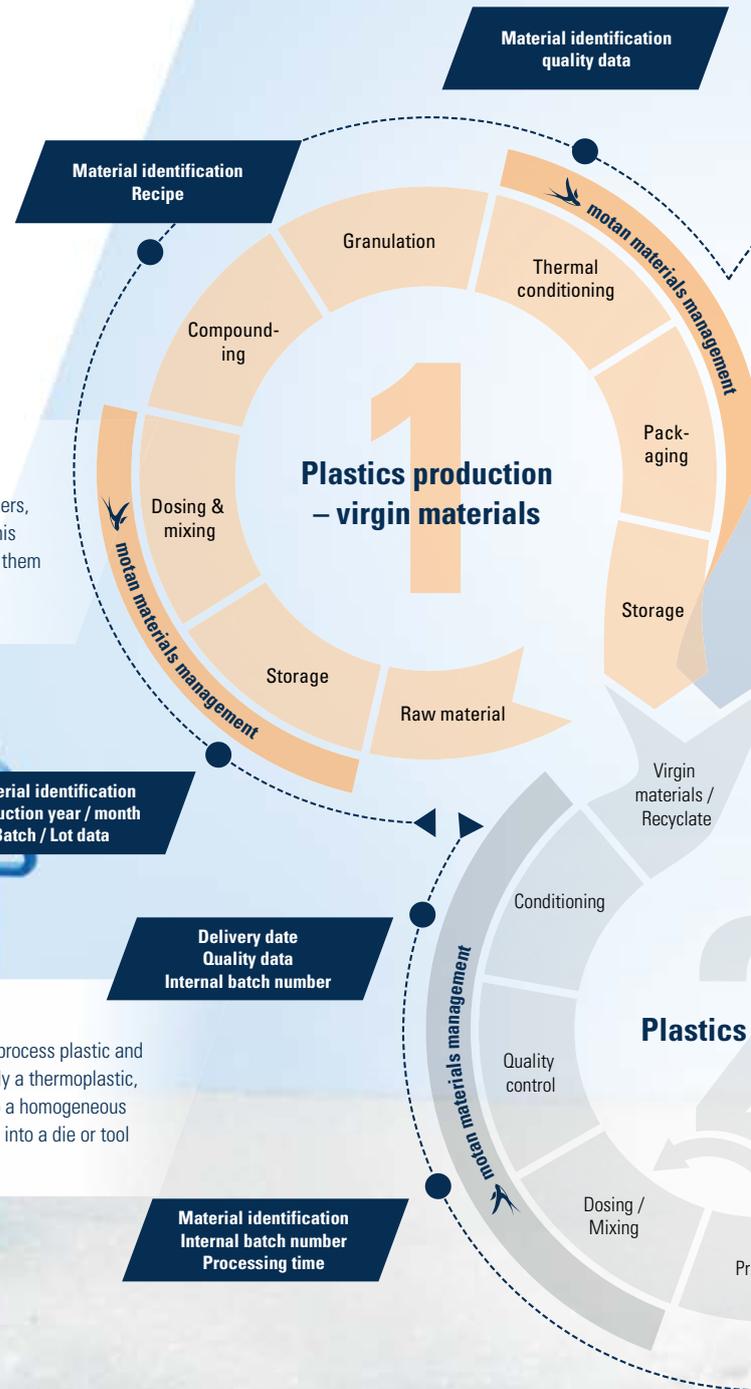
### 1. PLASTICS PRODUCTION

Raw plastic materials are usually supplied as liquids, powders, micropellets or coarse solids that cannot be processed in this state. Compounding these materials conditions and refines them into ready-to-use granular plastic materials.

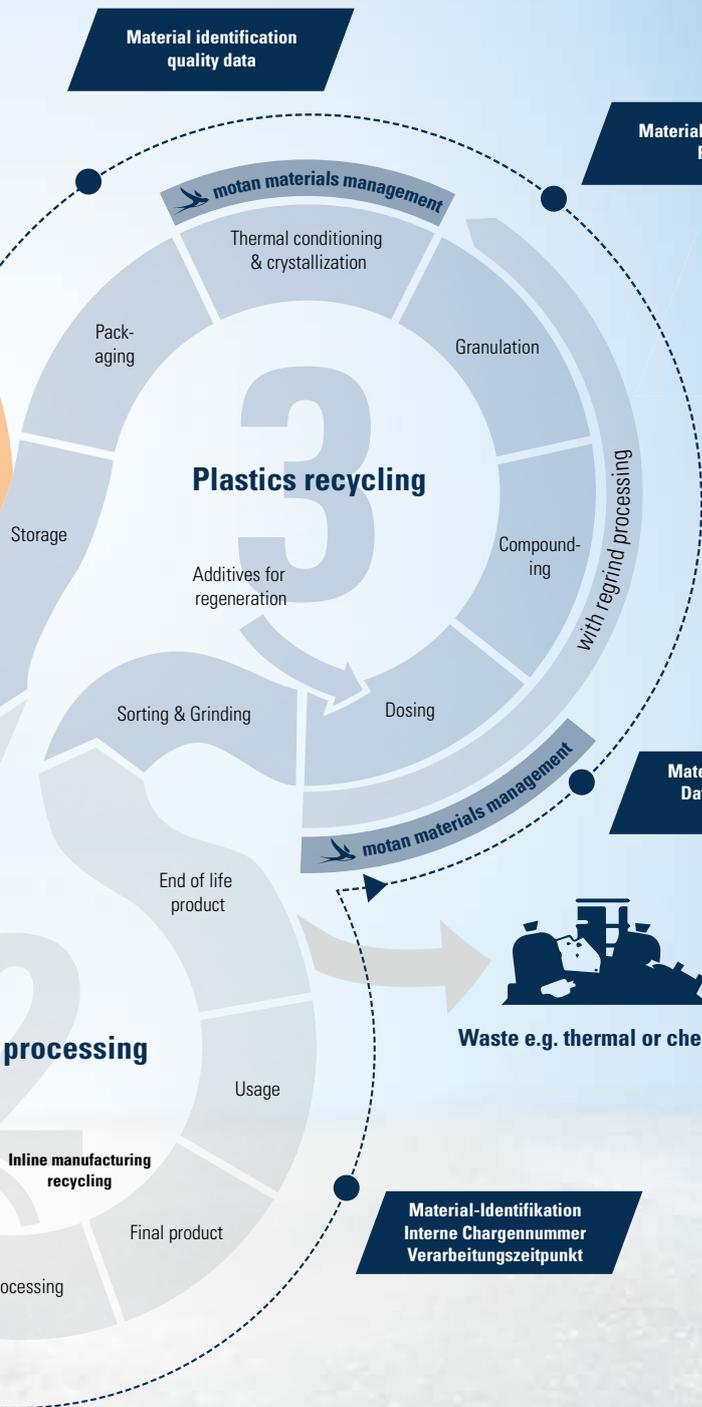


### 2. PLASTICS PROCESSING

Injection moulding, blow moulding and extrusion process plastic and turn it into a finished product. The material, usually a thermoplastic, is plasticized in a cylinder using a screw, mixed to a homogeneous mass, the molten plastic is then forced through or into a die or tool to form the shape of the finished product.



» WE WANT TO MAXIMIZE  
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AT THE END OF THEIR LIFE. «



**3. PLASTICS RECYCLING**

To produce recyclate, plastic waste must be collected and reprocessed into clean homogenous materials. The recycled plastics are compounded and conditioned ready for processing and their property profiles are specifically adjusted by adding additives.



# OUR PRODUCTS DESIGNED FOR A CIRCULAR ECONOMY



## GRAVICOLOR

GRAVICOLOR gain-in-weight dosing and mixing units dispense and mix up to six materials precisely and with maximum recipe accuracy. The integrated IntelliBlend process continuously analyses the process flow and achieves the best possible operating point at all times through self-optimization. Even when processing regrinds with fluctuating bulk properties, the units still achieve such a high process stability. Especially for the handling of materials with low bulk densities such as flakes, the GRAVICOLOR 600R and 1000 can be equipped with one or more extra wide dosing cones. So, guaranteeing optimum performance and reliability of the units.



## SPECTROPLUS

SPECTROPLUS is a synchronous dosing and mixing unit for a wide variety of materials – from granules, regrind / flakes or powders to liquids. There are both gravimetric, as well as volumetric versions available. It is also possible to combine volumetric and gravimetric dosing modules in one unit. The modular design allows the attachment of up to eight dosing modules to a base frame. The SPECTROPLUS can also be combined with SPECTROFLEX screw dosing modules which have flexible PU dosing hoppers – ideal for fragile and non-free-flowing materials. It is thus one of the most flexible overall systems on the market. With it, individual solutions for complex tasks can be easily designed, especially for the regranulation and processing of recycled materials.



## CPK CRYSTALLISER

Semi-crystalline materials with an insufficient degree of crystallization need to be crystallized before drying with dehumidified air. This is to avoid the material becoming sticky and clumping in the drying bin. For this purpose, a CPK crystalliser with KT agitator bin is used upstream of the drying process. This is a continuous process and the amorphous material is stirred inside a bin with an agitator until a sufficiently high degree of crystallization is achieved. The CPK crystallizers are specially designed for PET flakes and some bio-materials such as PLA.



A tall, cylindrical stainless steel material loader with an orange side panel and a blue control box. It has a hopper at the top and a discharge chute at the bottom. The brand name 'motan' is visible on the side.

## METRO F/R

With the METRO F/R material loaders, large quantities of dusty regrind and flakes can be conveyed automatically to the hopper of a processing machine, drying bin or day bin. Filters with sophisticated cleaning technology and large material discharge flaps guarantee trouble-free operation. For optimal dust removal, fines and dust can be actively removed as the material is discharged from the loader, this is conveyed to a central dust filter.

A shorter, wider stainless steel gravimetric material loader with an orange side panel and a blue control box. It has a hopper at the top and a discharge chute at the bottom. The brand name 'motan' is visible on the side.

## METROFLOW

With the METROFLOW gravimetric material loader, plastic processors can automate important areas of the production process cost-effectively and efficiently. The METROFLOW weighs every single load and evaluates the results, with a guaranteed precision of <math><1\%</math>. This offers great advantages, in the processing of regrind or flakes, because here the bulk density of the material can fluctuate frequently. Gravimetric throughput control greatly improves the entire material management process and allows for full traceability.

