Simply versatile.
Ideally equipped for special recycling jobs.

Plastic – the innovation driver.
The growing scarcity of natural resources means that raw material prices are increasing unstoppably. The only measures to counteract this are sustainable product management and effective recycling loops. As one of the most significant innovation drivers of the 21st century, plastic will play an even bigger role here. Using plastic waste in particular as an inexpensive secondary raw material with a variety of uses is the order of the day.

Recycling instead of wasting resources.
Waste materials are the key resource of the future. The EU plans to reduce the landfilling of plastic wastes to zero by the year 2020. This can be realised only with intensive collaboration between raw material suppliers, processors and recyclers and by using high-performance and application-optimised recycling technologies.

Special solutions from the Number One.
EREMA’s system portfolio sets global technology and quality standards both in the recycling of plastics from production waste and from post consumer waste from collection systems. EREMA has numerous successful examples currently in operation, even with the most complex special applications such as in the fields of automotive, compounding, bioplastics and wood-plastic composites (WPC). This far-reaching solution competence makes us the global Number One and also gives you the decisive competitive edge in your concrete application.

Key criteria in special applications:
1. Automotive
   Reliable and highly available technologies for the recycling of large-volume components, glass fibre reinforced injection-moulding parts, textiles, etc.
2. Compounding
   Modular plant concepts for the processing of varying raw materials with additives, fillers and reinforcing agents to make customised recyclates
3. WPC
   Water ring pelletising for maximum throughputs and minimum costs
4. Bioplastics
   Optimum handling thanks to sensitive processing and minimum thermal stress in the recycling process

The decisive benefits for the customer:
1. Flexibility
   EREMA systems are extremely flexible and robust in terms of the remarkable variety of input materials
2. Process stability
   Enhanced material intake over an extended temperature range, greater flexibility and operational reliability with a variety of materials and higher throughput rates with the same plant size thanks to Counter Current technology
3. User-friendliness
   Smart Start principle for extremely easy operation and maximum user-friendliness with EREMA systems
4. Extensive product portfolio
   Thanks to the extensive EREMA prod-uct portfolio we can offer you recycling solutions which are tailored exactly to meet your individual requirements
5. Output
   With EREMA systems you can achieve top throughput rates and pellet return rates back into the production cycle of up to 100 %
Application-oriented.
The EREMA solutions for special materials.

Automotive

Lightweight engineering with plastic.
Whereas vehicles used to be made primarily of metals some years ago, plastics today already account for around 15% of vehicle weight – and this figure is rising. The use of plastics in automotive applications is growing rapidly above all through efforts to reduce fuel consumption and CO₂ emissions in motor transport.

Reducing vehicle weight through lightweight engineering measures is the most effective way of doing this, with plastics such as PP, PUR and PA and bioplastics playing a key role. As a rule, the following applies: 100 kg of plastic used in a car replaces 200 kg of other materials.

Better ecobalance through recycling.
With the increasing use of plastics, however, pressure is also growing to attach greater importance to the recycling of plastic components in vehicles at the end of their service life. Further to this the EU End of Life Vehicles Directive stipulates that by the year 2015, 95% of the average weight of a vehicle must be returned to the recycling loop.

In order to improve the ecobalance of the vehicles, the automotive industry faces the task on the one hand of avoiding the creation of waste by improving product designs and, on the other hand, using plastics in a preventive way by taking into account their later recyclability.

Applications
- Automotive carpets, foot mats
- Bumpers
- Injection-moulding parts with or without glass fibre reinforcement in PE, PP, PA, PC, ABS, etc.
- Intake hoses
- Safety belts
- Fuel tanks
- PE tyre cord from used tyres
- Plastic films taken from compound safety glass (windscreen)
EREMA recycling solutions for automotive applications

Experience & competence.

EREMA has many years of experience in the recycling of automotive parts and has established itself as a reliable and competent partner to the automotive and auto supply industry. In collaboration with the EREMA research and development team well-known global industry players have been able to test the recyclability of new plastic components before they are used in a whole series of customised showcase projects.

In-house recycling solutions – COAX®

This patented recycling system stands out through the coaxial configuration of a single-shaft shredder and extruder with only one joint drive.

COAX® is ideal for large-volume, non-shredded material portions such as components made of PP with up to 30% fibreless content. The bespoke equipment featuring an armoured rotor and cutter holders is designed especially for automotive parts.

Benefits:
- Feeding with large-volume, non-shredded material portions (no pre-shredding required)
- The patented double pusher system ensures stable extruder performance
- ecoSAVE® reduces energy consumption by up to 10% as well as production costs and CO₂ emissions as a result

Recycling solution for car batteries – INTAREMA® T

The INTAREMA® T recycling system with patented, large cutter/compactor and single screw extruder without extruder degassing is the perfect technology for the processing of polypropylene (PP) from car batteries which are recovered, washed and broken up into chips. Thick-walled particles are heated through evenly well through an appropriately long dwell time in the EREMA cutter/compactor and dosed in the robust single-screw extruder.

Thanks to feeding with this preheated material there are no shearing peaks. The result is considerably less wear and increased filtration efficiency.

The EREMA cutter/compactor, an optimized screw design and innovative, patented add-on technologies mean high-performance degassing for the removal of moisture and volatile contaminants. The uniform and high-quality pellets produced as the end product are ideally suitable for the production of battery housings made of up to 100% recycled pellets.

Benefits:
- High-performance and flexible recycling system for flakes of thermoplastic polymers such as PP, PE or ABS
- Flexible in terms of the different particle sizes of the flakes
- Lowest wear and increased filtration efficiency through adequately long dwell time in the cutter/compactor and perfect pre-homogenisation of the feed material thanks to cutting, mixing, heating, drying, compacting and buffering in a single step
- Large-area ultrafine filtration as standard
- Constantly high output up to 2,700 kg/h
- Low energy consumption (0.20 kW/kg) thanks to ecoSAVE®
Compounding – COREMA®

Customised plastic recyclates.

When recycling plastics ranging from production to post-consumer waste from collection systems, quality fluctuations in the feed material can have a considerably negative impact on the property profile of the end product. Negative influencing factors here include not only mixed fractions of varying compositions, moisture, viscosity, type and degree of contamination but also the wide range of printed and laminated materials such as those in the packaging sector.

In practice this often restricts the use of recyclates as both the possible applications and the recycle share in potential end products are reduced with fluctuating properties.

Application examples

- PP nonwoven, PE edge trim, etc., filled with up to 80% CaCO₃
- Highly filled PP/talc recyclates from PP nonwoven production waste (for the automotive, household appliance, building and electronics industries)
- Washed PE-LD or PE-LLD agricultural films with CaCO₃ filler
- Airbag fibre waste and (silicone-coated) fabric waste reinforced with glass fibre – processed to make PA 6.6 recyclates for the production of injection moulding parts
- Heavily printed BOPP production waste with rubber flour from scrap tyres as a filler additive in the automotive, sport, leisure, household and building sectors
- Flakes – automotive sector, electronics waste

Specific upcycling.

With specific upcycling – the combination of sophisticated recycling and compounding technology – the share of secondary raw materials in the end product can be increased significantly without jeopardising the required quality of the application.

A wide variety of additives, fillers or reinforcing agents are admixed to the raw materials which are to be processed. The result is customised plastic recyclates for high-quality applications.
Compounding

COREMA® – EREMA upcycling solution

The modular system innovation COREMA® brings together for the first time all the benefits of recycling and compounding in a single process step. Here the proven, robust EREMA technology is used to turn recycling raw material such as PP nonwoven, PE edge trim or PA fibres into a filtered melt which then goes directly to a co-rotating twin-screw compounding extruder from Coperion, the global market and technology leader in the field of compounding & extrusion.

With its excellent mixing and gas removal properties this system component can handle all compounding tasks according to the customer’s individual wishes. Besides the dosing of a wide variety of additives, fillers and reinforcing agents (e.g. 80 % CaCO₃, 70 % talc or 50 % glass fibres) can be admixed in doses that are higher than those previously possible with EREMA recycling systems.

Upcycling with COREMA®

Benefits:
• Recycling & compounding in a single processing step
• Possible to use an extremely wide range of recycling raw materials flexibly thanks to the patented large EREMA cutter/compactor
• Proven, robust EREMA technology to provide filtered melt
• Minimum thermal stress and the lowest possible running costs through short, defined dwell times and direct dosing of the melt in the twin-screw compounder extruder
• Proven EREMA degassing technology with the EREMA cutter/compactor and extruder degassing
• Central user interface to control the whole system
• Modular system concept offers optimum adjustment to the respective application
• System configuration for capacities from 300 kg/h to 4 t/h
• ecoSAVE® reduces energy consumption by up to 10 % as well as production costs and CO₂ emissions as a result

EREMA cutter/compactor: cutting, mixing, preheating, drying, degassing, compacting, buffering
EREMA recycling extruder: plasticising, homogenising
EREMA melt filter: fully automatic and self-cleaning
Coperion twin-screw compounding extruder:
• Admixing of additives, fillers and reinforcing agents e.g.
  - up to 80 % CaCO₃
  - 50 % glass fibre, colour masterbatch
• Degassing

EREMA pelletising systems:
• For consistent pellet quality

Examples of raw recycling materials:
- PE film with paper content
- PP nonwoven
- PE, PP film (printed)

Examples of additives, fillers and reinforcing agents suitable for admixing:
- Colour masterbatch
- CaCO₃
- Glass fibre

Customised plastic recyclate
Bioplastics

Closed loops.

Growing environmental awareness is causing a boom in the demand for bioplastics with applications mainly in the field of packaging. Despite annual growth rates of 15 to 20%, bioplastics currently account for a global market share of only 0.4% and are not separated due to the amounts still being too low.

As these new material flows increase, however, so too does the necessity to create new collection and sorting systems so existing recycling loops are not jeopardised.

Global market share bioplastics 2011

Source: European Bioplastics

Bio ≠ bio.

When recycling bioplastics it is important to differentiate between biobased and biodegradable plastics. Biobased equivalents of conventional plastics such as bioPE or bioPET are no different to polymers based on fossil raw materials in terms of properties and can thus be processed with the same parameters.

However, bioplastics which are both biobased and biodegradable, such as starch-based products or also polyactic acid (PLA), require an adapted processing profile.

EREMA recycling solutions for bioplastics

Valuable pioneering work.

EREMA has been working on the processing of bioplastics for over ten years and has extensive experience in the recycling of biopolymer types, including bioPE, bioPET, PLA (fibres, films), PHA, starch-based products, etc.

INTAREMA® T

The INTAREMA® T system has proven itself continuously as a high-performance standard solution for PLA material. PLA is very sensitive to moisture and the shearing forces that arise in the course of processing. The EREMA technology processes PLA in an optimum way in that the material is carefully cut, homogenised, prespinned and dried to begin with in the cutter/compactor.

The drying in this process is so efficient that in many cases there is no need for any additional extruder degassing. This reduces the dwell time in the extruder and the material which is processed in this way is thus melted, filtered and pelletedised with minimum shearing stress.

Benefits:
- Perfect pre-homogenisation and drying of the input material for the extruder
- Improved material intake over an extended temperature range
- No viscosity loss, no disturbance of the valuable biobased polymer structure

Counter Current – a groundbreaking innovation.

- Highest process stability through improved material intake ensures constantly high output over a considerably broader temperature range
- Higher flexibility and operational reliability with a variety of materials
- Increased throughputs with the same plant size for more productivity

Throughput

With Counter Current technology

PATENT pending

Without Counter Current technology

Temperature inside cutter/compactor
With an average annual growth rate of 20 %, composite materials made of polymers and the sustainable raw material wood are without doubt materials of the future. The benefits of WPC products include longer service life, higher resistance and their workability using foam engineering and coextrusion.

WPC materials are used above all in the building trade (e.g. as flooring), the automotive and furniture industry.

**EREEMA recycling solutions for WPC**

**HG D water ring pelletising**

- Throughput considerably higher than with air pelletising
- Significantly lower investment costs and easier to operate compared to underwater pelletising
- Consistent pellet quality with residual moisture far below 1 % possible
- Production volumes of up to 2,000 kg/h

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**WPC production worldwide 2013**

*Source: EREMA market database*

- 220,000 t Europe
- 1,500,000 t USA
- 700,000 t China

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**Customised.**

The right system for every application.

EREEMA’s product range offers the right recycling solution for every application scenario. Besides systems for the recycling of special materials our range also includes in particular systems for the in-house recycling of production waste and heavily contaminated post consumer waste, FDA-compliant bottle recycling plus fibres, nonwovens, tapes and textile fabrics.

**Additional application brochures available**

- In-house & Industrial
- Post Consumer
- Bottle Food Contact Approved
- Fibre, Nonwoven, Tape, Textile
More questions?
We would be pleased to answer them!
Your EREMA advisor will be pleased to attend to your request personally and quickly.
If you are interested in a demonstration or a test run with your specific material it would be a pleasure for us to make an appointment and welcome you to our EREMA Customer Centre at the head- quarters in Ansfelden, near Linz in Austria.

We look forward to seeing you at EREMA!

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APPLICATION
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