

2013/2014

# RECYCLINGNEWS®

## 30 YEARS

The story of the global market leader EREMA

## EU GREEN PAPER

Closing plastic loops

## PRACTICE

International users report

# WELCOME TO THE NEW DIMENSION

EREMA presents INTAREMA® –  
featuring core technology for a  
new dimension in plastic recycling



**EREMA®**  
PLASTIC RECYCLING SYSTEMS



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EREMA is represented at numerous trade fairs and congresses around the world with trade fair stands and staff are popular guest speakers at trade events

## Welcome to the new dimension!

We wish you a warm welcome to the EREMA highlight at K 2013: the new INTAREMA® featuring revolutionary Counter Current technology. The K trade fair has always been of special importance to EREMA as it was at this show that the three founders Helmut Bacher, Georg Wendelin and Helmuth Schulz launched the first prototype which saw the beginning of EREMA's successful journey.

Thirty years on, we are proud to present another groundbreaking innovation to the international audience and the entire recycling industry – one that will generate a real boost in efficiency in recycling. Innovative strength was back then and still remains today a cornerstone of our success, together with our exceptional market orientation, the commitment and technical know-how of our employees and our proactive customer proximity.

As your customer benefit is the focal point of our investments at all times, we are fully committed to R&D, the development of new products such as INTAREMA® and continuous optimisation for your customer support. This is why we have – among other things – increased the EREMA team and created the space they require with two ultramodern floors of office space covering 1,700 m² which opened in April 2013.

Performance – this word stands for our services and products, in all areas of plastic recycling and exactly tuned to your requirements: In-house & Industrial, Post Consumer, Bottle, Fibre, Nonwoven, Tape, Textile und Special Materials.

With this in mind, we look forward to presenting the performance of the new INTAREMA® to you!



Klaus Feichtinger, EREMA CEO

Manfred Hackl, EREMA CEO





# An unparalleled journey to the world's Number One in the forward-thinking market of **plastics recycling**

Entrepreneurial success stories often begin in a garage. And this is where EREMA's story begins. It was exactly 30 years ago that the three engineers Georg Wendelin, Helmut Bacher and Helmuth Schulz joined forces with incredible pioneering spirit and founded a company to build recycling plants and technologies for the plastics processing industry. The year was 1983. The untiring commitment and technical inventiveness of all employees drove EREMA within a very short time to the global market and innovation leader in this industry. 30 years on, in 2013, the "inventor" from back then is now established as the worldwide Number One in the plastics recycling industry and continues to draw attention to itself through technology and innovation.

### 30 years of innovations

Since it was founded in 1983 EREMA has revolutionised the industry again and again with countless innovations. EREMA technologies have now been regarded as the leading global standard for a wide variety of recycling applications for decades. The centrepiece of the EREMA systems is the combination of a large patented cutter/compactor with extruder. However, EREMA is not only a plant engineering specialist, it has also always focused intensively on the various applications and associated requirements of the customers and their end products. The development of five application approaches enables EREMA technologies to be used for an extremely wide variety of recycling jobs in the fields of both in-house production waste recycling and severely contaminated post consumer waste. According to the two EREMA CEOs Manfred Hackl and Klaus Feichtinger, besides this exceptional market orientation and innovative strength, the lasting success is based on two further factors:

proactive customer proximity and dedicated employees. This is what enables EREMA to implement its dynamic growth strategy with success, growing constantly at the headquarters from its own resources and further strengthening its position as the Number One in plastic recycling system engineering.

### The big breakthrough

EREMA managed the major breakthrough with the first generation of systems launched in the year it was founded. The company combined for the first time ever a cutter/compactor with a – back then still radial – extruder and thus made it possible (also for the first time) to cut, compact and extrude waste plastic in a single, continuous process. "Waste" was transformed into high-quality recycled pellets – a valuable secondary raw material. The machines were straightforward to operate, had low space requirements and consumed on average 30 % less energy compared to the competition at that time. Major importance was attached to

this new technology for the economic recycling of thermoplastics within a very short time.

### Revolutionary technologies

The continuing development of this technology enabled EREMA to launch the second plant generation in 1993, which once again brought about an almost dramatic change in the industry. Thanks to the extruder now being located tangentially to the cutter/compactor, EREMA was able to enhance the quality of the end products enormously while increasing output and performance considerably, too. Additionally, a newly defined and optimised scaling of the cutter/compactor in relation to the screw diameter of the extruder connected (patented) made feeding even easier with very large individual portions. The longer dwell times in the big cutter/compactor were a further benefit of this innovative technology, making it possible to direct the material to the extruder with much more homogeneous temperature distribution.



# 30 YEARS OF EREMA

## The three founders

Helmut Bacher, Georg Wendelin and Helmuth Schulz



1984

Developing further, improving further – part of EREMA's success then and today (photo: Helmut Bacher)



1986

EREMA headquarters



1993

EREMA employees celebrate the 500th machine



2010

High-performance degassing with TVEplus® at the K show



2012

Customer-oriented, solution-oriented, responsible and respectful: EREMA employees have lived by these values since 1983



1980 | 1985 | 1990 | 1995 | 2000 | 2005 | 2010 | 2015



1983

EREMA's first K trade fair



1984

EVOLUTION part I: The cutter/compactor-extruder combination (radial) establishes itself in the market thanks to its numerous benefits



1991

Prototype of the EREMA RTF melt filter



1993

EVOLUTION PART II: Change from radial to tangential – the new extruder configuration improves feeding, process consistency and throughput



2007

CEO Gerhard Wendelin († 2012) opens the new extended company building



2013

EVOLUTION PART III: The new INTAREMA® with innovative Counter Current technology means even more efficiency in plastics recycling

Patented add-on technologies for specific applications such as Double Disc and Air Flush Module, for example, not only ensure high material quality but also broadened the processing range of the systems.

## Product highlights

The dynamic nature of the company is reflected above all in the success of the ongoing further and new development of plastic recycling technologies and plant systems. The numerous innovation

highlights include products such as VACUREMA® – PET recycling systems for direct food contact, TVEplus® for heavily printed and contaminated plastic waste, COAX® for large-volume material portions (such as fibre bales, ropes, automotive parts, etc.) and COREMA®, a combination of proven recycling and compounding technology for customised recyclates.

## New dimension

The company is still a hive of activity in this, the 30th anniversary year of the

global market leader. After EREMA added two floors covering 1,700 m² for a total of 100 workplaces at the headquarters in Ansfelden near Linz in spring 2013, the next technical and innovative sensation followed in October. EREMA presented the latest plant generation INTAREMA® at the K 2013 in Düsseldorf – a new dimension in plastic recycling system engineering featuring a new core technology and further groundbreaking innovations. EREMA has thus set another milestone in the unparalleled success story of the company (see pages 10 to 15).

## EREMA WORD RAP:

■ Question to Georg Wendelin, one of the three founders of EREMA: How did you experience the breakthrough of EREMA at K 1983?  
**"Our first EREMA system with the new concept was so popular among the international specialists that we sold two plants straight away to well-known clients. One of these plants is still in operation today. The K '83 trade fair was the breakthrough for EREMA!"**

■ Question to Andreas Kreindl, EREMA sales professional: How would you sum up working at EREMA?  
**"What was impossible yesterday is possible today. Thanks to EREMA. This guiding principle has often proved true during my 25 years of working at EREMA and has also been confirmed many times by customers."**

■ Question to Justin Umphries, Maintenance Manager at McNeely Plastics Clinton, USA: Is there anything you have always wanted to say to EREMA?  
**"Man, I'll tell you what: You guys build one of the finest, most consistent and highest quality machines I've ever worked with in my 18 years in plastics!"**



# EU Green Paper

## European Commission aims to close plastic loops

The European Commission published the Green Paper “On a European Strategy on Plastic Waste in the Environment” on 7 March 2013. This road map for an even more efficient use of plastic resources in the future has been welcomed by Plastics Recyclers Europe (EUPR). According to EUPR President Ton Emans, this is an important step in closing plastic loops and increasing sustainability. EREMA fully agrees, in keeping with their own statement: “We close the loop”.

It would be hard to imagine the modern world without plastics: they reduce weight and fuel consumption in cars, help shape the design of furniture and clothing and enable packaging which is lightweight, safe and food-contact compliant. However, the processing of plastic waste creates a number of specific challenges. Recycling plastics to make a valuable secondary raw material plays a major role in treating natural resources with greater efficiency and protection and drastically reducing the negative environmental

impact of landfilling. Europe is considered to be leading the way as many countries already have a recovery rate of 50 per cent. There is great potential, however, for higher rates. The purpose of the new EU Green Paper, therefore, is to develop this pioneering role. As the processing of plastics is still not specifically regulated by EU waste legislation, new legal framework conditions are particularly necessary. Also with a view to supporting strongly innovative companies in the plastics recycling industry – such as EREMA.

### In the sense of sustainability

The intention of the new Green Paper is to launch a broad reflection on how we can reduce the impact of plastic waste on the environment and make plastic products more sustainable throughout their service life as a whole. It emphasises the key role which plastic has in numerous industrial processes and applications and the potential economic benefits which higher recycling rates entail. As the global population grows and natural resources

become scarce, the recycling of plastics is a compelling alternative to the exploitation of raw materials. Framework conditions have to be improved in order to speed up this new thought process and support both the environmentally friendly design (eco-design) throughout the entire product life cycle and ecological innovations from industrial companies like EREMA.

### EU-wide appeal

Member states and interested parties are invited to submit their views on whether and how the relevant legislation should be amended to find a solution for plastic waste. They are called upon to take measures to prevent waste and give priority to re-use instead of other waste management channels such as landfilling. Moreover they are requested to comment on the effectiveness of potential targets for recycling and economic measures (e.g. landfill bans, landfill taxes and levying volume-related waste disposal charges). The question is raised as to

how the modular and chemical design of plastics can be improved in such a way that they can be recycled better, how the amount of litter in the world's oceans and seas can be reduced and whether there is any demand for the promotion of biodegradable plastics. In the defined targets of the Green Paper, with the promotion of eco-design and landfill bans, Ton Emans sees solutions to increase plastics recycling and thus preserve resources, create green jobs and reduce the environmental impact.

### Next steps

The consultation process featured 26 questions and ran until the beginning of June 2013. Findings will be taken into account in further political measures in 2014 which are part of a general review of waste disposal policy. This will examine in particular the current targets for the processing of waste and for landfill sites and there will be an ex-post evaluation of the five waste stream directives.

### ■ IN SHORT

**EU Environment Commissioner Janez Potočnik:** “Managing plastic waste is a major challenge in terms of environmental protection, but it's also a huge opportunity for resource efficiency. In a circular economy where high recycling rates offer solutions to material scarcity, I believe plastic has a future. I invite all stakeholders to participate in this process of reflection on how to make plastic part of the solution rather than the problem.”



# “WELCOME TO THE NEW DIMENSION”

**INTAREMA®** – featuring core technology for a new dimension in plastics recycling

In the year of the company's 30th anniversary the global market leader EREMA launched a plant system with new core technology and additional innovations at K 2013 in Düsseldorf: INTAREMA®.





# INTAREMA®

The groundbreaking new feature of INTAREMA® can be seen in its name which comes from **INVERSE** + **TANGENTIAL** + **EREMA**® and is based on the newly developed and globally patented Counter Current technology. The result of this innovation: INTAREMA® brings together in an unparalleled way top productivity, flexibility and extremely easy operation with considerably lower energy consumption.

## The revolutionary Counter Current system

The central core technology of the new INTAREMA® system is the patented Counter Current system which shows its impact in the border area of the cutter/compactor and tangentially connected extruder. Inside the cutter/compactor the rotation of the rotor disc which is equipped with tools forms a rotating spout so that the material is circulating the whole time. In the Counter Current system this material spout – unlike the previous technical standard – moves against the direction of the extruder. As a result, the relative speed of the material in the intake zone, i.e. when passing from the cutter/compactor to the extruder, increases to such an extent that the extruder screw acts in the same way as a sharp cutting edge which now cuts out the plastic. The result of this inverse tangential configuration of the new INTAREMA® plants: the extruder handles more material in a shorter time and is much more independent in terms of the pre-compacting level of the material. To date the worldwide technical standard

has been a system in which the material in the cutter/compactor moved in the direction of the extruder. The centrifugal forces arising in the process were used for the feeding of the extruder and the treated, warm material was thus “packed” into the extruder screw. The inverse tangential configuration of the Counter Current system, on the other hand, now ensures that the extruder screw is filled virtually pressure-free with the preheated material. Or in other words: the screw takes what it needs, the extruder always has the ideal filling level and is never overfilled, which makes it much better to regulate.

## Improved material intake over extended temperature range

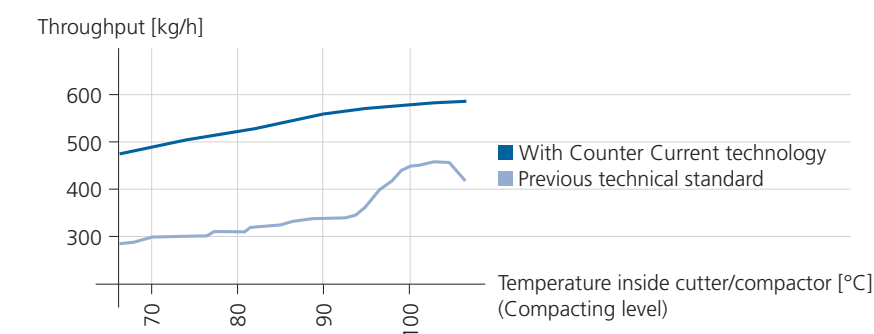
Why do INTAREMA® systems offer sufficiently high flexibility in order to be able to react to faster input changes when recycling to make valuable secondary raw materials? Inside the cutter/compactor the feed material is buffered and pre-conditioned optimally for the extrusion

process. The material is cut, homogenised, warmed, dried and above all compacted to ensure constant extruder feeding. Here it is crucial that the temperature inside the cutter/compactor influences the degree of compacting of the material: the higher the temperature, the higher the degree of plastic material compacting. With the Counter Current system the feeding of the extruder from the cutter/compactor depends significantly less on the compacting level of the plastic material, which in turn considerably broadens the range for optimum extruder feeding (see diagram). This means that the recycling system is not only more flexible in the selection of the operation point, it is also much more reliable in operation. With the system used previously the packing and pressure had the risk of sticking, especially in the case of very light materials with low energy content (such as fibres or thin packaging films) or materials with a very low softening point (such as PLA) which could mean reduced material intake. With Counter Current technology, thanks to the improved material intake, capacity is not only in-



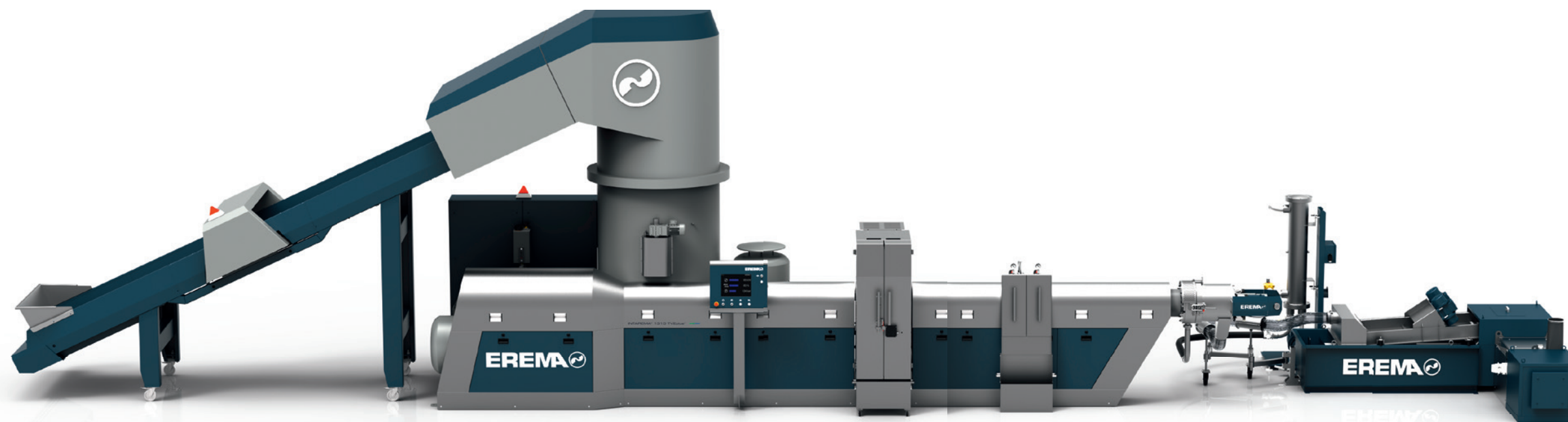
creased, it also stays at a constantly high level over a much broader temperature range. The operation range for optimum system capacity has thus been extended considerably (see diagram). As a result, temperature changes in the cutter/compactor due to fluctuations in feeding have hardly any effect on plant performance and the quality of the recycle. In addition to this there is also greater flexibility in the selection of the optimum operation point. This is of particular advantage when processing very temperature-sensitive materials.

Simple effect with a major impact – Counter Current, a groundbreaking innovation



Results from development trials (in cooperation with customers of many years) with in-house waste based on LLDPE blow/stretch film production with a thickness of 30 µm document with the example of an INTAREMA® 1108 T the improved material intake with Counter Current technology: throughput stays at a constantly high level over a significantly wider temperature range.





## Constant output despite input fluctuations

INTAREMA® technology also represents a quantum leap in the field of post consumer recycling. It stands out here above all through its high degree of flexibility. Although the input material here typically fluctuates highly in terms of moisture, compactness and other parameters, the new technology ensures that throughput

and quality of the recycled pellets produced remain at a constantly high level. The fluctuations in post consumer recycling result not only from mixed fractions of varying compositions, moisture, viscosity, type and degree of contamination but also especially from differently printed and laminated materials in the packaging sector. The system likewise gives you the highest possible flexibility when processing materials with particularly

high input moisture and contamination levels, such as e.g. washed agricultural films, washed post consumer film flakes (LDPE, LLDPE, HDPE), films with solid content such as paper, wood or metals and also thick-walled regrind materials from waste automotive and electronic goods, PS cups and PE lids.

## Enhanced automation with "Smart Start"

With the new, intelligent "Smart Start" concept, many central process steps run completely automatically. Staff at the machine can operate it very easily by pressing just a few buttons – the same worldwide, without having to think about the operating language. This is because the few operating symbols are clear and easy to understand. The integrated recipe management of INTAREMA®, a particularly practical and time-saving feature, enables plant operators to save all settings and parameters for the optimum result of a

special recycling application under one "recipe name" and call it up at any time at the push of a button. A single press on the "Extruder" symbol is enough to start the entire downstream equipment up to the extruder automatically and in the right sequence. If you now press again but this time on the "Cutter/compactor" symbol, the cutter/compactor and automatic feeding begin: the system starts up itself with the recipe set previously, goes into production with the highest degree of safety and works with constantly high quality. Furthermore, INTAREMA® comes with a standby mode which automatically switches the system to standby if there is no input material and reduces it to a lower operation point – plus the display shows you that material is required. As soon as the system is refilled with input material it starts up automatically again. This function is executed fully automatically by the standby mode - without any operators and without having to press any buttons. The clearly structured and simple design

of the handling enhances the overall accessibility and operability of INTAREMA® systems which are supplied with the intelligent "Smart Start" as standard, including ultramodern, ergonomic touch display.

## Further developed ecoSAVE®

A further technical innovation highlight of the new plant generation is the systematic advancement of ecoSAVE® technology (equipped as standard) which enables users to benefit from 10 % less energy consumption, a reduction in CO<sub>2</sub> emissions and lower production costs. The overall package of design and process engineering measures includes the highly efficient direct drive of the INTAREMA® extruder screw with an up to 3 % higher degree of extruder efficiency and a practical energy display which gives you a constant overview of energy consumption. Specific measures can also be taken to optimise consumption.

## ■ IN SHORT

The INTAREMA® efficiency boost:

### INTAREMA® T

Compact, with short single-screw extruder, without degassing, ideal for non-printed edge trim, cutting waste, rolls, loose leftover film regrind materials, etc.

### INTAREMA® TE

Featuring double degassing for the processing of slightly printed production or industrial waste, fibres and technical plastics.

### INTAREMA TVEplus®

Efficient ultrafine filtration, full melt homogenisation and high-performing degassing in a single step, for materials that are difficult to process such as heavily printed films and/or very moist feedstock.

INTAREMA® systems are available for capacities ranging from 50 to 3,000 kg/h.



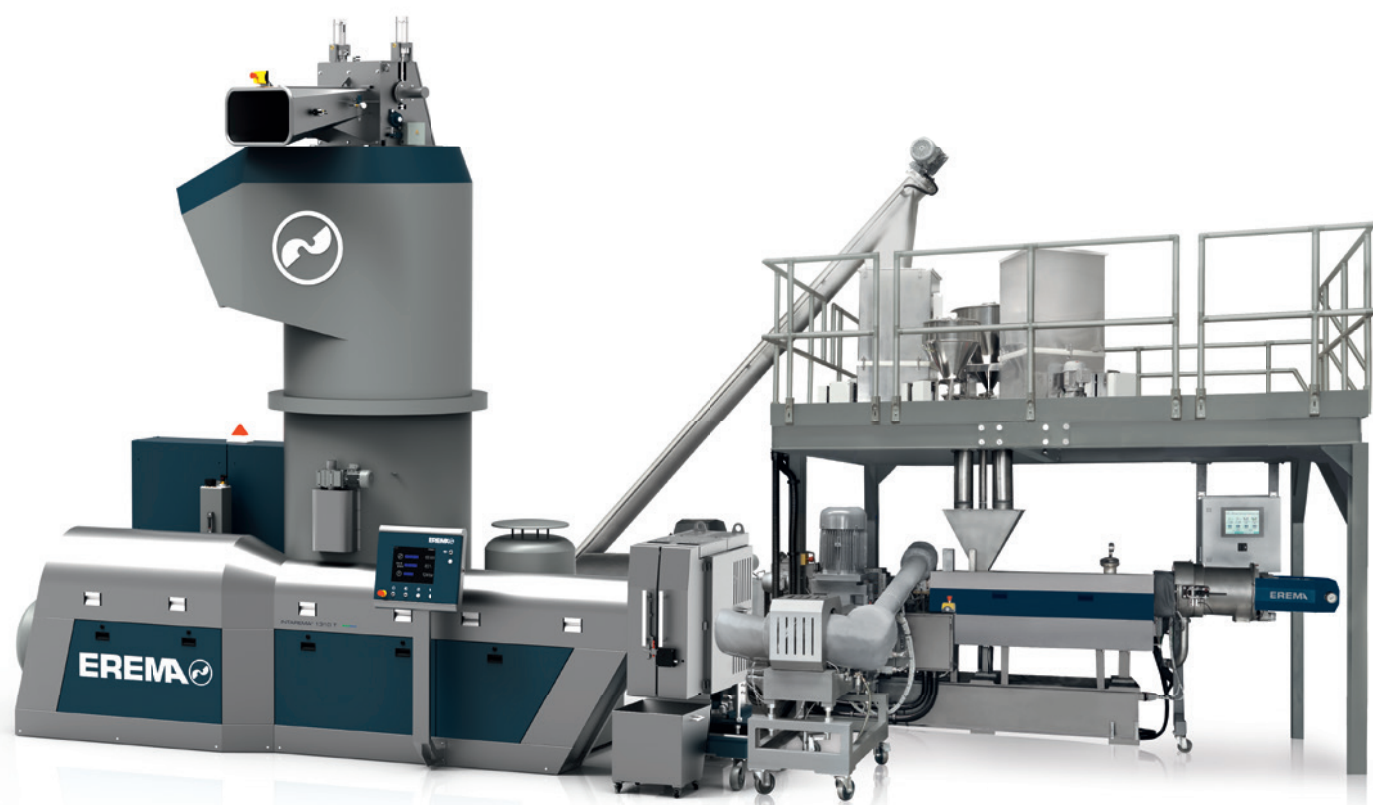
The intelligent "Smart Start" concept makes working with EREMA systems extremely easy.





# Refining recyclate: Upcycling with **COREMA®**

When recycling plastics ranging from production to post consumer waste from collection systems you always face quality fluctuations with regard to the feed material. The combination of proven recycling and compounding technology now enables you to make better specified recyclate for varied and demanding applications.



Plastic is becoming an increasing economic factor as a valuable secondary raw material. The reasons are plain to see. Whereas the production of plastics has increased by 8% per year over the last decade, the decline in primary raw material resources is increasing on a drastic scale. The fact is that raw material prices are continuing to soar. This means that more and more importance is being attached to high-quality secondary raw materials. On the other hand, however, and in contrast to virgin material, plastic ranging from production to post consumer waste from collection systems poses the problem of ever increasing quality fluctuations. 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 especially in the packaging sector. In practice this is often the limiting factor when using recyclates as both the possible applications and the recyclate share in potential end products are reduced with fluctuating properties. EREMA shows with its new product COREMA® how proven

recycling technology in combination with compounding technology enables the production of better specified recyclates. Thanks to specific property enhancement, the materials which are processed can once again fulfil exacting requirements.

## CO-RE-MAKES it possible

COREMA® brings together all the benefits of recycling and compounding in a single process step for the first time. Deviations in starting material quality can be compensated by the use of proven recycling technology and the admixing of fillers and/or reinforcing agents, thus realising a property profile which is in line with the end application. The compounding technology comes from Coperion GmbH, the global market leader in this segment. In the first step, inexpensive recycling raw material (e.g. PP nonwoven, PE edge trim, PA fibres, etc.) is turned into filtered melt using the proven, robust EREMA technology. The recycling system from the Austrian mechanical engineering company works together with the patented cutter/compactor and a tangentially linked single-screw extrusion system.



From airbag production waste or



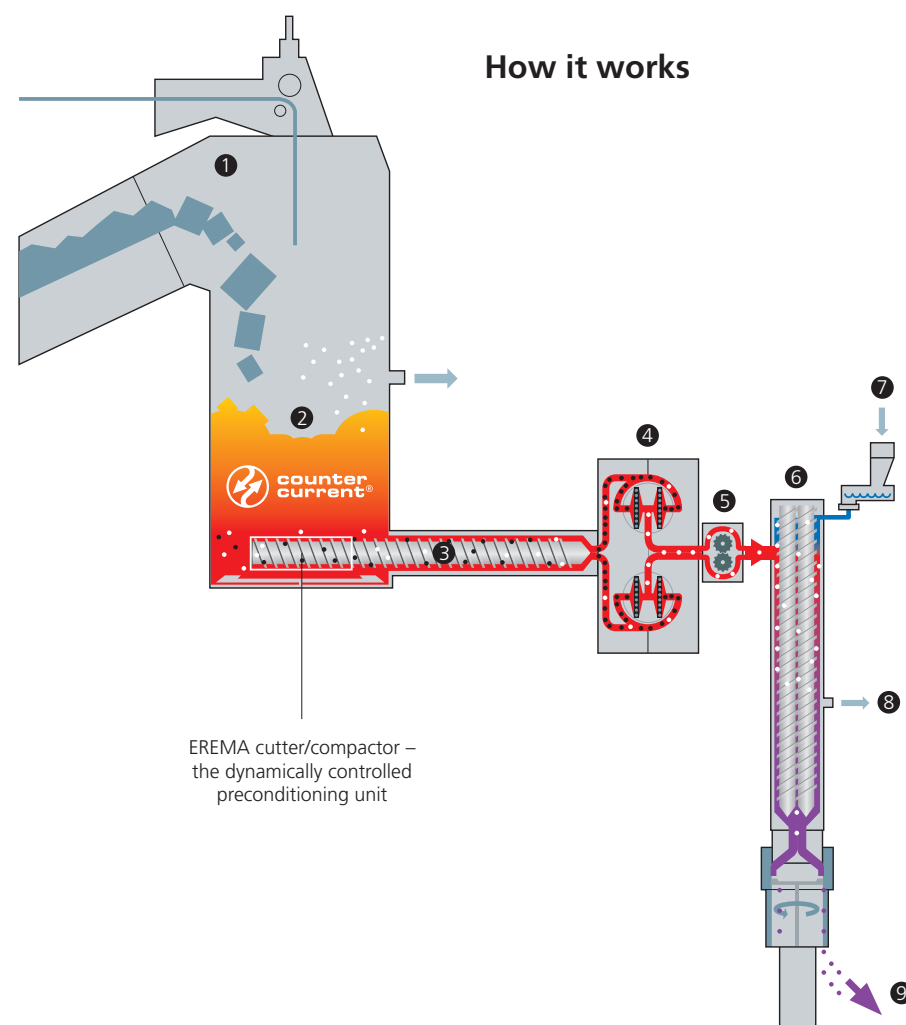
washed agricultural film flakes to



high-quality recycled pellets.



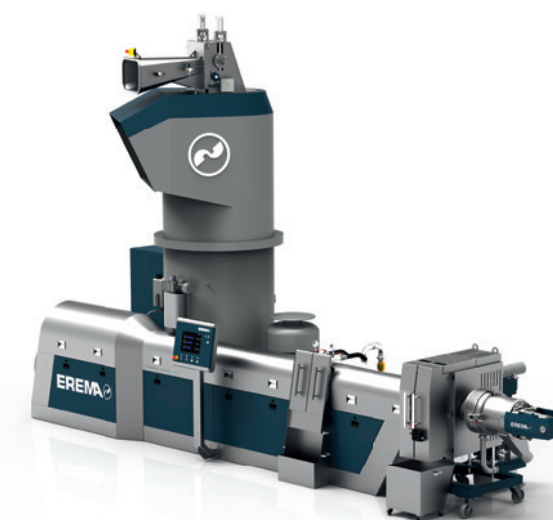
Feeding (1) is automatic: loose material such as PP nonwovens or regrind material is fed in via a feed conveyor belt and film enters the system direct on rollers using a roller intake system. The cutter/compactor (2) cuts and homogenises the feed material with rotating cutter tools. At the same time the feedstock is dried solely by the processing heat which is generated and compacted ready for intake in the extruder. The preheated material is plastified in the direct and tangentially connected single-screw extruder (3), homogenised and cleaned in the fully-automatic, self-cleaning filter (4). For the second step the prepared and cleaned melt then goes via the melt pump (5) directly to a co-rotating, self-cleaning twin-screw extruder (6) from Coperion. This flexible part of the system is configured in such a modular way that thanks to its excellent mixing and degassing properties it can be adapted to any individual task. Besides the dosing of a wide variety of additives, both high amounts of fillers and reinforcing agents (7) (e.g. 80 %  $\text{CaCO}_3$ , 70 % talc or 50 % glass fibres) can be admixed and also virgin material in the production of polymer blends. The compounded melt is degassed in the degassing zone (8) and forwarded to the respective tool (9).



In particular the short, defined dwell times and direct dosing of the melt in the twin-screw extruder reduce thermal stress on the material enormously. Additionally, operating costs are reduced and the modular system concept offers optimum adjustment to the respective application.

In summary the COREMA® system stands out above all through flexibility in terms of possible materials and plant configurations and, with regard to quantity, is available for both smaller amounts of 300 kg/h and large amounts of up to 4 t/h.

## Closed loops: **Bioplastic** wants to be recycled as well



Growing environmental awareness is causing a boom in the demand for bioplastics mainly in the field of packaging. EREMA has been working on this topic for over ten years and has extensive experience in the recycling of a multitude of biopolymer types, including bioPE, bioPET, PLA (fibres, films), PHA, starch-based products, etc.

According to European Bioplastics some 1.161 million tonnes of bioplastics are currently produced and the forecast for 2016 is over 5 million tonnes. Despite annual growth rates of around 20 %, bioplastics currently account for a global market share of only 0.4 % of total plastic production and are not separated due to the amounts of post consumer waste still being too low.

bioPET or bioPE are no different to those of polymers based on fossil raw materials – they are merely made from a different raw material and can thus be processed with the same parameters. Biodegradable types include starch-based products or also polylactic acid (PLA) which require an adapted processing profile in recycling.

### Valuable pioneering work

### Know-how required

In order to be able to close bioplastic loops you need appropriate collection and sorting systems together with suitable processing plants. Currently, however, it is primarily only production waste in defined loops which is recycled. It is important to differentiate between bio-based and biodegradable plastics. The characteristics of biobased types such as

Thanks to over 400 trials in the EREMA Customer Centre every year and customer applications EREMA has a wealth of empirical experience and already uses it to close bioplastic loops. PLA, for example, 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, prewarmed 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. The benefit here is that the material spends less time in the extruder and is thus melted with minimum shear stress, filtered, pelletised and recycled without viscosity loss.

### ■ Read the full article

This text was published as an editorial feature in the German industry magazine "Kunststoffe" 04/13. Find out more about how COREMA® works in detail and get an insight into real-life case studies featuring highly filled PP/talc recyclates from nonwoven materials,  $\text{CaCO}_3$  repellets from silage films, fibreglass reinforced PA 6.6. recyclates from airbags and rubber flour as a filler additive on [www.ere.ma.at/news](http://www.ere.ma.at/news)



## SOREPLASTIC Belgium: High-quality LDPE and LLDPE from recycled agricultural films

The company Soreplastic is located near the town of Champlon and specialises in the recycling of plastic films in the agricultural and horticultural sector. It has been operating one of the most modern and high-performing recycling facilities in Europe since 2011.

Recycling agricultural film into new material is an exceedingly difficult and complex task as it is usually heavily soiled with mineral and organic matter. Moreover, the soft film, typically measuring only around 25 µm to 100 µm in thickness, does not lend itself easily to cutting, separation and cleaning. On the other hand these films consist of high-grade plastics such as LDPE and LLDPE which are keenly in high demand as recyclates in the film industry and can fetch good prices if the quality is high. In the highest quality grade they even fulfil the requirements of stretch film production.

### Highest technical requirements

Soreplastic decided in favour of technologies from Lindner reSource and EREMA as the top high-tech equipment required for this process. Once the material has been freed of coarse foreign matter the Power Universo 2800 machine optimised by Lindner reSource especially for films cuts it down to 50 to 100 mm shreds. Due to the impurities which are still present, the shreds then pass through a washing cycle in the next step followed by downstream wet grinding and drying.

### Sturdy recycling extrusion line

Following this the 20 to 30 mm shreds are processed with the EREMA 1716



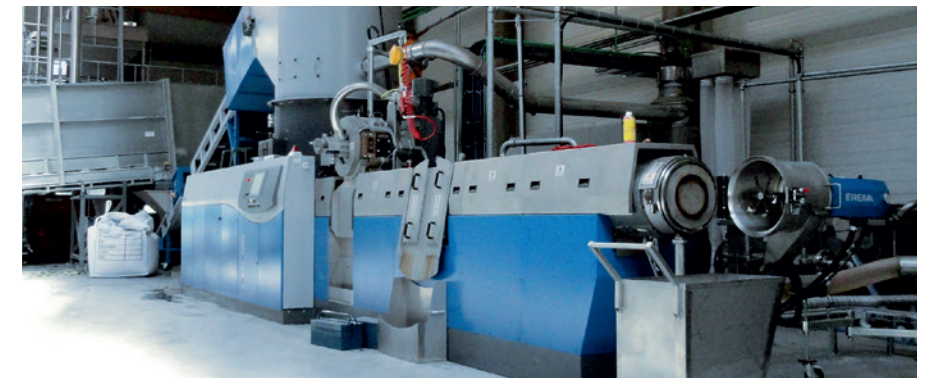
**Silage bales are among the key applications for PE stretch film in agriculture and thus a main source of film waste from this industry.**

TVEplus® recycling extrusion line to convert them into pellets for the production of new blown film. The system is specially optimised for processing the washed PE shreds with their high input moisture. The film shreds which are still too large and too moist to be fed directly to the extruder are reduced further in size, dried and compacted in the upstream, patented

and multifunctional cutter/compactor. Air flushing ensures that most of the residual moisture evaporates from the pre-heated material. Moreover, the cutter/compactor acts as a buffer store from which pre-

compacted, heated material is then supplied continuously to the directly connected single-screw extruder. The TVEplus® series is designed specifically for such applications and differs significantly from conventional extruders in some aspects. The special design of the draw-in and melting zone promotes backwards degassing in the direction of the extruder intake.

Moreover, the melt filter – in this case a continuously working laser filter which is ideal for such a high degree of contamination – is arranged upstream of the degassing station. This means that any contaminants liable to degassing in the extruder are thus removed at a very early stage - i.e. before the melt is homogenised. Only after it has passed the melt filter is the filtered melt subjected to homogenisation, which then enables efficient degassing. The degassing zone is followed by the discharge zone, from where the perfectly conditioned melt is fed to the pelletiser. Soreplastic utilises an EREMA HG 244 D type hot die face pelletising system. The last stations passed by the finished pellets are a dewatering screen and a pellet centrifuge before the product is filled into big bags or sacks. Soreplastic's EREMA 1716 TVEplus® delivers an output capacity of approx. 1,400 kg/h at a typical repellets batch size of 25 tonnes.



**Highly efficient EREMA 1716 TVEplus® recycling/extrusion line with laser filter system at Soreplastic in Belgium.**

### ■ IN SHORT

Vincent Sciascia, Managing Director of Soreplastic: "Due to our feedstock being of a problematic nature we found the high process stability and high output of the EREMA cutter/compactor/extruder system convincing. With the TVEplus® system we can produce top-quality repellets continuously with high cost efficiency."



## LINDNER reSOURCE Germany: Successful partnership

The Lindner Group headquartered in Spittal, Austria, was founded in 1948 as a mechanical and plant engineering company and is today regarded as a competent supplier of shredding technology for industrial applications. Its sales and customer support company Lindner reSource GmbH based in Grossbottwar, Germany, represents the Group's plastic and recycling activities, supplying high-powered single-shaft shredders with throughputs from 300 to 10,000 kg/h to industrial customers. EREMA also appreciates the merits of Lindner shredders:

the proven and robust technology of the Austrian mechanical engineering company has been in use at EREMA's Research & Development Centre at the company's headquarters in Ansfelden for a long time. Lindner reSource presented its new Antares single-shaft shredder at the K 2013 show in Düsseldorf. Managing Director Harald Hoffmann sums up the key benefit of the new shredder with a certain amount of pride: "Throughput is up to one third higher than that of previous machines in this class but the price level has remained unchanged."



**The new Antares single-shaft shredder from Lindner reSource presented at K 2013.**



# POLYMER PROCESSORS Australia:

## High performance, easy operation



Ryan Smith, Minister for Environment and Climate Change, finds the performance of the new EREMA TVEplus® at Polymer Processors in Melbourne convincing.

Polymer Processors Pty Ltd in Melbourne specialises in the recycling of all types of polyolefins to make high-quality recycled pellets. These include LDPE film, packaging and containers in LLDPE and a wide range of various HDPE and polypropylene regrind material, primarily for customers in the injection moulding sector.

### TVEplus® increases output

Polymer Processors have a number of EREMA TVE systems for a high level of efficiency. Some months ago the company was able to increase its output even further with the installation of a new EREMA TVEplus® 1514 system. "We are really pleased about the performance of the TVEplus®. The new system produces

up to 1,000 kilograms of output material per hour – in a very high quality," says John Wilson, owner and managing director, who goes on to emphasise the user-friendliness as a bonus which also impressed him on the HG 244 D, the pelletising system of the TVEplus®. This hot die face pelletiser with Direct Drive technology stands out through top cutting precision together with exceptional operational reliability and gives the company the necessary flexibility in the pelletising process.

### Government supports recycling

To support recycling projects which in turn create new jobs and increase recycling

rates, the Victorian Coalition Government provided funding for recycling companies in spring 2013. Polymer Processors received part of this funding for the investment in the only silage wrap recycling facility in Australia. Silage wrap had previously either been buried on farms or burned but thanks to this new technology the wrap can now be collected by Polymer Processors and refined into plastic pellets. According to Ryan Smith, Minister for Environment and Climate Change, the service will benefit regional and rural Victoria. It is estimated that thanks to the EREMA TVEplus®, Polymer Processors will be able to recover between 1,000 and 2,000 tonnes of input material in the first year, increasing to around 5,000 tonnes after three years.

# MARTOGG Australia:

## Flexibility & top quality

The Martogg Group is Australia's largest privately owned plastics compounder, processing a multitude of raw materials such as LDPE, HDPE, PP, ABS, ASA and also technical plastics including polycarbonate and nylon. The company also used to process material from other recyclers. However, due to the lack of control over the quality of the bought-in material, Martogg decided some years ago to branch out into recycling – and chose EREMA as its partner.



The Martogg & Company headquarters / EREMA sales manager Fritz Wimmer (left) with Marcus Hogg, Managing Director of Martogg.

The idea behind the "Life Cycle Management" (LCM®) developed by Martogg's recycle division Martogg LCM® to be able to produce high-quality recycled pellets to add to the quality of the main business of compounding. The company's processing of an extremely broad spectrum of material and the requirement of also being able to admix additives and fillers called for a very high degree of versatility in the technology employed. "EREMA has a very good reputation in Australia's recycling industry and the flexibility of TVEplus® technology was absolutely convincing for us. Thanks to EREMA we have found exactly what we were looking for,"

explains Marcus Hogg, Managing Director of Martogg. He mentions in particular not only the outstanding mixing performance of the cutter/compactor/extruder combination which enables you to mix different materials for precisely defined pellet quality but also the higher throughputs with consistently good degassing.

### More than satisfied

Martogg operates several EREMA systems at different locations. The high degree of user-friendliness (also with regard to pelletising), low maintenance and the robustness of the systems are appreciated by managers and other members of staff.

"The machines are required to run 24/7, and still remain highly efficient. This is why we chose in favour of technology from EREMA, which stands for robustness and longevity," explains Marcus Hogg, more than satisfied.

### State-of-the-art

Martogg uses EREMA 1514 TVEplus® above all to process heavily printed PE, BOPP and PP films. Marcus Hogg even goes as far as describing the satisfaction with this system as follows: "This technology represents the state-of-the-art in the plastics recycling industry in Australia and we can certainly confirm this."



## KOBUSCH UK: rPET expansion

Kobusch UK concluded its planned expansion in the field of rPET with the installation of a new inline sheet facility in 2013, continuing its high-quality collaboration with EREMA and SML. Kobusch UK now produces 100 % food-contact compliant rPET flat sheet with the new system.

Kobusch UK has already been operating a VACUREMA® inline sheet system from EREMA and SML in Livingston since 2007 for direct, single stage processing. A VACUREMA® Basic 1514 T with a directly connected downstream flat sheet system from SML process post consumer PET bottle flakes and their own production scrap at a throughput of approx. 1,000 kg/h to make food-contact approved rPET film for the production of thermoformed PET trays. To follow on from this success a new, larger system from EREMA/SML has just been commissioned at the Stanley plant. The VACUREMA® Basic 2016 T now enables throughputs of up to 1,400 kg/h.

### Key benefits of direct processing

Using VACUREMA® technology, food-contact compliant rPET monolayer sheet can be produced directly from PET bottle flakes thanks to efficient decontamination. The decontamination is an advantage compared to conventional ABA multilayer films as rPET can only be used in the middle layer (B) as it does not undergo any decontamination process. This means that a cover layer (A) of virgin

PET material has to be used for food-contact approval. "Thanks to the efficient decontamination of VACUREMA®, Kobusch UK is now even able to produce food-contact grade film from pure rPET," says Manfred Hackl, joint CEO at EREMA, on the benefits of the system.

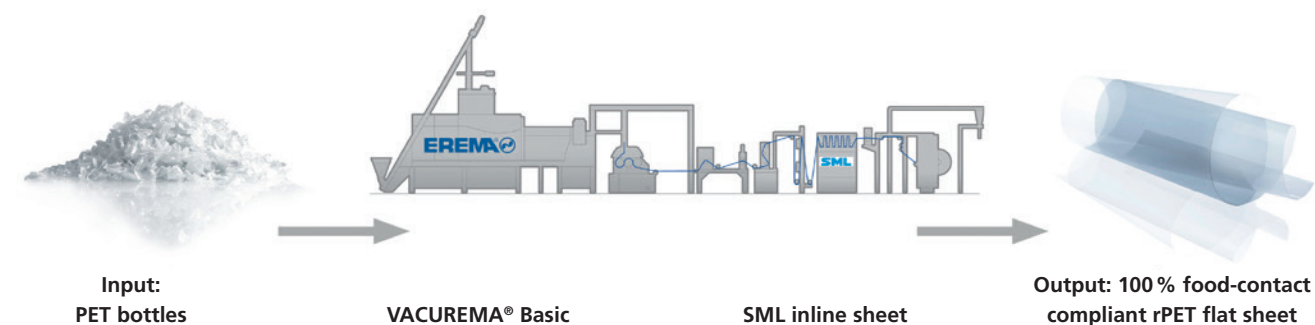


### Benefits of VACUREMA® inline technology

Since it was launched in 1998 VACUREMA® has become the technology used most around the world in what is known as the bottle-to-bottle recycling of post consumer PET bottle

flakes. Numerous country-specific approval certificates and also the internationally recognised certification by the US FDA document the suitability of the rPET produced in this way for direct food contact. VACUREMA® also stands out in combination with a direct downstream thermoforming film system, i.e. a complete inline sheet solution, for the production of rPET films and another cost-effective and profitable business opportunity. One particular technical benefit of VACUREMA® inline technology is that it is highly flexible in terms of the bulk density, shape and mixture of the feed material – PET secondary raw materials such as bottle flakes, ground amorphous skeleton waste, virgin material, edge trim and mixtures of them with virgin material are recycled directly to make end products such as FDA certified and ILSI compliant thermoforming film and even fibres and strapping. One further benefit: the IV values of the PET melt remain stable – even if the moisture inside the feed material varies. High input moisture values of up to around 1.5 % are possible. Economic benefits include the compact and space-saving design of the VACUREMA® and ecoSAVE®, which

**Economic production in a single step:** flat films produced directly – without an intermediate pelletising stage.



reduces not only energy consumption by up to 10 % (at around 0.25-0.28 kWh/kg including drying) but also production

costs and CO<sub>2</sub> emissions at the same time. There are currently more than 140 VACUREMA® systems in operation around

the world and 39 of them are already inline sheet solutions with an annual production capacity of 217,000 tonnes.

### IN SHORT

Tony Mitchell, Kobusch UK Sales Director: "The new EREMA system with downstream SML equipment enables us to continue to increase the amount of post consumer waste in our rPET products without sacrificing any quality in purity in the thermoforming process."

## EXTRUPET South Africa: World's only BRC-accredited bottle-to-bottle recycling plant

The company Extrupet produces the high-quality food-grade rPET resin PhoenixPET. After upgrading from a VACUREMA® Basic to a VACUREMA® Advanced system Extrupet was the first and only to be certified by the British Retail Consortium (BRC) for food-grade rPET in 2011. "The challenge is to completely remove all contaminants from our starting material which is PET bottles. VACUREMA® can handle this because of its high residence time in the vacuum reactors," explains Chandru Wadhvani, Joint Managing

Director at Extrupet. The capacity of around 500 t of food-grade rPET per month is produced in two different IV grades: one for thermoforming uses such as in the manufacturing of sandwich packs and the other for the production of PET bottles. PhoenixPET thus meets the stringent food safety standards of both the EU and the US FDA and complies with all PET packaging requirements, which is why it is also the choice of South Africa's top retailers such as Woolworths and Pick 'n Pay.





# CARBONLITE USA: Water bottles with 50 % rPET for Nestlé

Nestlé Waters North America Inc. is rolling out bottles with 50 per cent recycled PET for the well-known USA mineral water brands Arrowhead®, and Resource®. The food contact grade rPET for these bottles is provided by state-of-the-art PET recycling company CarbonLITE of Los Angeles and is produced using VACUREMA® bottle-to-bottle technology from EREMA.



CarbonLITE operates one of the most modern PET recycling facilities in the USA. The company processes more than two billion plastic bottles collected from municipal curbside systems and deposit centres annually at its 20,000 m² plant. Leon Farahnik, who founded CarbonLITE with Neville Browne, sums up the philosophy of the company as follows: "We're committed to being the leading bottle-to-bottle recycler, preserving resources and reducing the carbon footprint from PET bottle production."

California Governor Edmund "Jerry" Brown Jr. was full of praise for CarbonLITE at the grand opening at the plant in March 2012: "Companies like CarbonLITE are revolutionising the recycling industry and dramatically reducing the huge amount of plastic dumped in California landfills every year."

## Satisfied customers: Nestlé and PepsiCo

Nestlé Waters named the new PET bottle with 50 % recycled PET the ReBorn™ bottle. The half-litre bottles meet the stringent FDA standards, look no different than those made with virgin PET resin and are just as durable and functional. PepsiCo Inc. is also among the other well-known major international clients who count on the extremely clean and food contact grade rPET from CarbonLITE.

## Saving energy in production through VACUREMA®

The production of this high-quality rPET does, of course, require the appropriate recycling system. And CarbonLITE uses VACUREMA® technology from EREMA for precisely this purpose. The two VACUREMA®

Prime 2321 T systems which are each designed for a capacity of 2,500 kg of material per hour play a key role and ensure that decontamination is efficient and fast.

"Besides its performance, the high degree of energy efficiency of the EREMA system is decisive – in keeping with the CarbonLITE philosophy of saving both energy and resources," says Neville Browne, emphasising this further strength of bottle-to-bottle VACUREMA® technology.



# INTER-PET Ukraine: From PET bottles to PET preforms

The company Inter-PET in Ukraine has everything under one roof. To begin with 12 mm-sized amorphous PET flakes are produced from used PET bottles which are then processed with a VACUREMA® system to make pellets. The efficient decontamination and compacting of the high-performance VACUREMA® vacuum reactors ensure that the viscosity level of the pellets produced is higher than that of the input material. The melt is then conveyed directly to a vacuum degassing

extruder with a capacity of 200 kg PET per hour. Following this the pellets are crystallised and mixed with virgin PET material to make PET preforms for technical applications. According to Alexander Gaponenko of Inter-PET, depending on the application, up to 100 % of the pellets from their own manufacture are processed into PET preforms, mostly for use exclusively in the technical packaging sector, such as for example engine oil containers.



**In operation for 12 years at Inter-PET:**  
EREMA control cabinet with Siemens Control.



## M&G FIBRAS Brazil: PET bottle recycling

Gruppo Mossi & Ghisolfi (M&G Group), one of the world's largest producers of PET, recently started out in the bottle-to-bottle recycling business with its subsidiary M&G Fibras Brasil. In doing so, the company relies on proven VACUREMA® technology for the production of high-quality and food-contact grade rPET.



### Decisive criteria

The highly efficient and fast decontamination together with the large-area ultrafine filtration enable you to produce extremely clean recycled pellets using VACUREMA® technology. And, as electrical energy accounts for 38 % of the costs in bottle-to-bottle recycling, integrated ecoSAVE® technology is convincing, with the lowest production costs of all systems on the market. M&G Fibras in Brazil has been convinced of these criteria.

Leading global brands in the field of soft drinks and water such as Coca Cola, Pepsi, Danone and Nestlé rank among the top customers of the international M&G Group, with annual turnover in the region of 3 billion US dollars. When the manufacturer of new material decided to produce rPET in future, too, the reliability of the system - besides its efficiency - was at the very top of the agenda. EREMA supplied a VACUREMA® 2018 also featuring remote maintenance and monitoring software precisely for

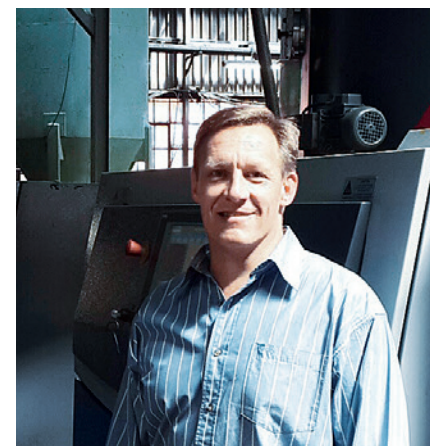
this purpose. Amauri dos Santos, General Manager of M&G Fibras Poços de Caldas Plant, reports: "We decided in favour of VACUREMA® technology because the system is known in Brazil for its operational reliability and there are already numerous EREMA reference systems here which fulfil the stringent Brazilian criteria of the ANVISA (National Health Surveillance Agency)." Also, the system fulfils all technical requirements concerning approval for food contact in accordance with FDA criteria.



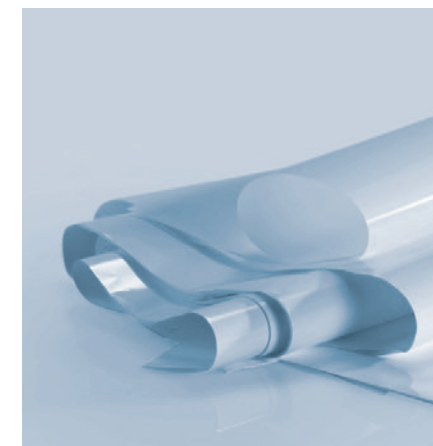
**Amauri dos Santos, General Manager of M&G Fibras Poços de Caldas Plant in Brazil, finds the benefits of the VACUREMA® technology convincing.**

## TRANSPACO South Africa: High-tech recycling system for PP & BOPP films

Thanks to TVEplus® technology from EREMA, TRANSPACO Recycling of Johannesburg has not only been able to increase its monthly capacity of post consumer plastic waste by 500 tons, they have also been able to meet special customer requirements regarding PP and BOPP factory scrap.



**Jaco Breytenbach, Managing Director of Transpaco Recycling: "For us, it's a real breakthrough! We're not only meeting customer expectations but also assisting in reducing the waste content at landfills."**



Transpaco Recycling is the biggest recycler of low-density PE in South Africa. With regard to the recycling of plain PP films and printed (in some cases multiple printed), metallised and laminated BOPP factory scrap the company previously had to turn down numerous inquiries because they did not have the technology to deal with it.

### Technology from the global market leader

"We wanted to have the best equipment for the job," explains Jaco Breytenbach, Managing Director of Transpaco Recycling,

"and we found this in TVEplus® technology from EREMA." The new system now enables Transpaco Recycling to fulfil all customer requirements and deliver a clean, consistent recycled granule every time.

### TVEplus® bonus

High-performance degassing, thorough melt homogenisation and ultrafine filtration are by no means the only benefits which the TVEplus® system has to offer. With patented Double Disc (DD) technology materials with up to 12 % residual moisture can be processed with

consistently high output. The patented Air Flush Module increases drying performance and capacity while ensuring lower energy consumption and extended service life. Additionally, ecoSAVE® reduces energy consumption by up to 10 % and thus production costs and CO<sub>2</sub> emissions at the same time.

### Growing customer base

The recycled PE granule is sold primarily to plastic packaging converters and it is anticipated that the recycled PP and BOPP will be sold mainly into a new target market in the injection moulding sector.





Hazel McCallion, mayor of Mississauga, presenting the CPIA Award 2013 in the category "Sustainability" to Mike Horrocks, CEO EREMA North America.

## CPIA Sustainability Award: Prestigious accolade for EREMA

The Canadian Plastics Industry Association (CPIA) presented the "Sustainability Award 2013" to EREMA North America in recognition of the recycling system manufacturer's contribution to increasing sustainability in the Canadian plastics industry.

### Emphasis on innovative strength

The CPIA commented on their decision as follows: "Thanks to EREMA, we can now recycle better and recycle more." Since EREMA started serving the North American market, more and more recyclers have adopted the company's leading technology to recycle post-industrial, post-commercial and post-consumer plastics. The CPIA, the voice of over 2,400 companies in the Canadian plastics industry, mentioned in particular the high degree of innovation at EREMA which creates new markets for plastics recycling.



The ENA demonstration test centre in Ipswich will feature this brand new INTAREMA 1108 TVEplus®.

## EREMA North America: Test centre to feature INTAREMA®

To meet the growing demands of the plastics recycling industry in the USA and Canada EREMA North America (ENA) will be adding two brand new INTAREMA® systems with its innovative Counter Current technology to its customer demonstration test centre in Ipswich, Massachusetts. An 1108 T will be installed this year and this will be followed by an 1108 TVEplus® at the beginning of the next year. "The recycling market here is very lively," says Mike Horrocks, one of the two CEOs of EREMA North America, "and with the new TVEplus® system we can serve the growing post consumer sector even better."

With the installation of this new technology at the Ipswich site EREMA customers will benefit not only from faster turnaround times for trials, but also much lower transport costs for the shipment of their trial materials.

# Present worldwide Trade fairs and congresses

EREMA takes part in around 50 trade fairs and congresses around the world every year – with their own trade fair stand or as a welcome specialist to present speeches. Shows attended range from Arabplast, Interplastika, NPE and Plastmilan to the industry's premier fair K; congresses include SPE Thermoforming Conference in Atlanta, PET Forum in Italy, PET-NOLOGY Europe in Nuremberg and the Extrusion Days in Finland's Tampere.



speeches himself, such as at the Global Plastics Summit in Chicago or the Plastic Recyclers Europe Annual Meeting in Amsterdam. PET specialist Christoph Wöss is likewise an acknowledged speaker who, as product manager for VACUREMA® vacuum technology – the technology used most often in PET recycling – is able to offer valuable expert knowledge to attendees.

### Focus on future markets

By participating in trade fairs such as Chinaplas, Plastindia, Plastimagen in Mexico or Feiplastic in Brazil EREMA underscores its keen interest in markets with particularly high recycling growth. In May 2013 an application from the in-house sector was demonstrated live at Chinaplas: a 756 TE system featuring double degassing turned PE production waste into high-quality recycled pellets on the EREMA trade fair stand. EREMA also demonstrates its expertise in future recycling themes with speeches at key trade congresses such as "Bioplastics" in Duisburg or "WPC" in Cologne.



"As a globally organised company with national representatives and subsidiaries in all five continents, these branch events are of course an important sales platform for us. Besides this, however, we also aim to get to know customers and markets even better in the local environment.

This is part of our proactive approach to customer proximity," says EREMA CEO Manfred Hackl. Additionally, numerous EREMA employees attend congresses and symposiums around the world where they share their knowledge as popular guest speakers. Manfred Hackl also gives



# INTAREMA®

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