

TRANSFORM

LINDNER

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NEWSLETTER
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CASE STUDY

LINDNER'S MICROMAT TIDIES UP.

Comberplast is cleaning up coasts at the edge of the world – with the help of a Lindner Micromat 1500.

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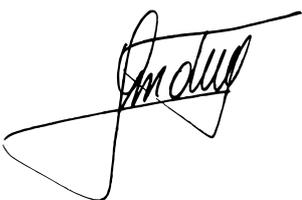
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AT THE FOREFRONT OF THE TREND.

Even if the big wave surrounding environmental protection in the media seems to have been driven off the cliff by viruses and political skirmishes, the topics of recycling and the sustainable use of resources continue to play on people's minds. But more importantly: on the minds of consumers. Yes, raw material prices had their ups and downs in recent months and in some cases challenged our industry. It is, however, very much the politicians' task to enforce a solution that ultimately decouples the price of recyclates from the crude oil market.

Still, it's amazing how often special offer stickers are replaced with colourful statements such as 'Made from recycled plastics' or '100% recyclable'. Advertising strategists place these in online shops, from digital corner shops to multi-billion book retailers, but also in the deluge of promotional leaflets received every week.

It shows us that the recycling industry is playing an increasingly important role in the international consumer market, and many major corporations are stepping up their activities in this area. Therefore, it will become even more important in the future to transform a wide variety of waste plastics into first-class materials. We need to develop technologies that can take on new challenges and scale these solutions to satisfy the global hunger for sustainably produced products – and that's exactly what we are working on.



DI Manuel Lindner
CEO



Mag. Michael Lackner
Managing Director

AST GROUP AND LINDNER LAUNCH CENTRE OF COMPETENCE FOR THE SUSTAINABLE USE OF RESOURCES IN HDPE PRODUCTS

The European manufacturer of plastic containers, drums and bottles, AST, has set a long-term target to increase the amount of recyclates used in its products and aims to supply their own 'raw materials'. For this reason, AST is investing in a new centre of competence with a complete plastics recycling line to process post-industrial and post-consumer HDPE (high density polyethylene). As a project partner, they are relying on the expertise and a system solution from Lindner.

*AST Kunststoffverarbeitung GmbH
headquarters in Erndtebrück, Germany*

AST GROUP AND LINDNER LAUNCH CENTRE OF COMPETENCE FOR THE SUSTAINABLE USE OF RESOURCES IN HDPE PRODUCTS



Since 1977, AST Kunststoffverarbeitung GmbH has been producing high-quality packaging with approval for dangerous goods in Erndtebrück, Germany. Today, the company is a European market leader when it comes to plastic containers for chemical products or food, and it is working hard to increase the sustainability of its products by using recyclables.

If you ask AST what the new centre of competence is all about, the complexity of the topic quickly becomes clear. Here, legal requirements in terms of product safety meet the principles of the circular economy and EU strategies for avoiding plastic waste. The aim of the new project is to gather experience, pave the way for future strategies and introduce the use of recyclates in the series production of technically demanding HDPE containers and drums. Ultimately, the company wants to produce a sustainable flow of raw materials in their own right. The new centre of competence is a pilot project that aims to harness the experience and expertise at the AST locations in southern Germany, Belgium, the Netherlands and Great Britain.

AST has chosen the Austrian industry pioneer Lindner as its technology and development partner. The washing and sorting components come from Lindner Washtech, a company specialising in plastics recycling, which is also responsible, together with AST, for the facility's entire engineering. The shredders of the parent company Lindner Recyclingtech complete the system solution. Hauke Grabau, responsible for recycling at AST, explains: 'We transform premium plastics into high-quality containers, drums and bottles and believe that this raw material should not go the general recovery route. With the new centre of competence, we want to retain this valuable material in the loop. My many years of experience in the field of plastics recycling have shown me that Lindner offers the best overall package and expertise in mechanically recovering polymers. We have seen from the very beginning that Lindner is willing to tackle new problems and that we can learn from each other in the joint development of this project.' ■



Hauke Grabau, responsible for recycling at AST: 'With the new centre of competence, we aim to increase the amount of recyclates used in our products in the long term.'

CIRCULAR ECONOMY IN ARGENTINIAN AGRICULTURE



Lindner's washing system makes sure that the LDPE flakes are optimally cleaned and ready for subsequent extrusion.

CIRCULAR ECONOMY IN ARGENTINIAN AGRICULTURE



Lindner's Micromat impresses with its continuous output performance and the knives long service life despite shredding heavily contaminated materials.

Economically, Argentina depends on agriculture. Cattle are bred, soya, grain and other crops are grown on an area of 157,000,000 hectares to feed, in theory, 400 million people. Production on this scale generates millions and millions of delicious steaks with corresponding accompaniments, as well as around 70,000 tonnes of plastic waste every year – mainly heavily soiled agricultural films, bags and containers.

The Asociación de Cooperativas Argentinas (ACA) in Cañada de Gómez, 70 kilometres west of Rosario, Argentina's

third largest city, has taken on the task of recovering this LDPE agricultural film contaminated with soil and organic components. ACA is an agricultural cooperative and also one of the largest farms in the country. The film, which is turned into recycle, comes from the company's own production facilities and equates to 10% of the plastic waste produced by the agricultural sector in Argentina per year. In a four-stage process, the contaminated, 180-250 µm thick films are recycled using Lindner shredding and washing equipment. The contamination of the material makes

primary shredding a major challenge in the recovery process. For this reason, a Lindner Micromat 2000 shreds the plastics to the optimum particle size of around 60 mm as required for the rest of the process. The shredder ensures continuous throughput with knives that have a long service life. Then, in the pre-washing stage, the flakes are freed from coarse foreign matter and cleaned as well as dried with friction washers. The clean flakes are extruded into pellets, which are yet again used for the production of agricultural film – a nicely closed loop. ■



Every year, Argentina's agricultural sector produces around 70,000 tonnes of highly contaminated plastic waste such as agricultural film.



Adrián Borovich from Lindner's Argentinian sales partner Megaplast (left) and Ivan Litvinov, Plant Manager at ACA (right) are pleased with the premium regrunulate, which is once again being used to produce agricultural film.

COMBERPLAST IS CLEANING UP COASTS AT THE EDGE OF THE WORLD WITH LINDNER'S MICROMAT 1500

Lindner's new 1500 model from the Micromat series was presented at K 2019 in Düsseldorf, Germany. In impressive live outdoor demonstrations it showcased the shredding of fishing nets as the first step in the recovery process. This very model was delivered to Chilean plastics recycler and circular economy pioneer Comberplast at the beginning of last year and has been successfully shredding old fishing nets and ropes collected from the Patagonian coasts for the past year.



Julio JR Compagnon is pleased with the optimal output from Lindner's Micromat 1500 ready for the next step in the recycling process.

COMBERPLAST IS CLEANING UP COASTS AT THE EDGE OF THE WORLD WITH LINDNER'S MICROMAT 1500

The nets and ropes discarded on the coasts of Patagonia are collected by locals and taken to collection points.



Nature lovers and globetrotters alike find even the mere mention of this region breath-taking: Patagonia. Besides rugged mountains shaped by Pacific winds and impressive landscapes, it is above all the fjords and coasts that – Covid travel restrictions apart – attract more and more visitors to this strip of land in southern Chile every year. Michel Compagnon from Santiago de Chile is one of them. Besides the magnificent spectacles of nature, one thing in particular caught his eye: discarded fishing nets and ropes, which are a burden on the environment and can bring the life of many sea creatures to an unhappy

end. When asked about this, the local fishermen simply described the carelessly discarded rigging as waste. But for Compagnon, Commercial Manager at the plastics recycling company Comberplast, the unpleasant scene became a project to save the oceans and the incomparable beauty of Patagonia. And that is how the Atando Cabos project started.

What began in 2016 with a handful of samples in a travel suitcase is now a project that transforms over 3,000 metric tons of ropes and nets into new products every year. The entire recovery process, from shredding

and cleaning to the extrusion and injection moulding of new products, takes place on site at the Comberplast facility in Santiago de Chile. For more than 25 years, the company has been committed to the circular economy, even before circular concepts in plastics recycling became the latest buzzword.

The many international awards for environmental protection and innovation confirm Julio JR Compagnon, CEO of Comberplast and co-founder of Atando Cabos, that he is on the right track: 'The global awards make me so proud. They show us that another path ▶



The plastic waste from the fishing and fish farming industries ...



... is used to produce, among other things, high volumes of pallets and crates.

COMBERPLAST IS CLEANING UP COASTS AT THE EDGE OF THE WORLD WITH LINDNER'S MICROMAT 1500

is possible and that doing the right thing for people and the environment can also be a profitable business. Or to put it another way: the real purpose of business should always be to solve problems in both economically and environmentally sustainable ways.' The large amounts of old fishing nets, lines and other discarded plastic materials are recycled and converted into innovative new products, for example for the agricultural and mining industries, or also turned into green pallets for an international brewery.

Since 2020, Comberplast has relied on the shredding technology of Lindner's Micromat 1500, equipped with an optimised cutting system from the Mono-Fix kit. Julio Compagnon explains: 'We process plastic waste from fish farming and fishing companies. These materials were developed by very clever people not to ever break or tear. Shredding is therefore an especially big challenge. In processing, we are always looking for new solutions to tackle more difficult projects and to keep production economically viable. In Lindner, we found an experienced partner who was willing to go the extra mile with us – not many companies will do that.'

The delivered materials are usually heavily loaded with abrasive substances such as sand, stones or organic material. That is why, when selecting the shredder, the main concerns besides high energy efficiency were the costs of wear and tear. Now, after a year in operation, Compagnon is pleased: 'We got the Micromat in January 2020 – just at the start of the pandemic. The situation required us to find new ways of commissioning

and servicing despite the physical distance. Thanks to the great cooperation of the Lindner team in Austria, the Chilean sales partner Ingeniería Delta Limitada and our technicians here on site, we were able to successfully install and commission the shredder – everyone involved did an excellent job. Since then, our shredder has been running like clockwork and we look forward to many more joint projects in the future.' ■



Video of the success story: <https://youtu.be/Dliez63SCf4>

EXTENDING THE SCOPE OF SHREDDERS FOR PLASTICS RECYCLING WITH A FLEXIBLE CUTTING SYSTEM

Modern plastics come in all shapes and sizes, and are used in countless applications. The different materials must be, for example, particularly tear-resistant in terms of ropes or nets, withstand great pressures in the case of pallets and similar, or keep their shape as for cladding parts. The underlying parameters are mechanical properties such as elongation at break, impact toughness or Shore hardness. However, these factors not only determine the polymer's area of application or the service life of the end product, but also require different approaches to shred and process these materials for recycling purposes in line with the concepts of the circular economy.



EXTENDING THE SCOPE OF SHREDDERS FOR PLASTICS RECYCLING WITH A FLEXIBLE CUTTING SYSTEM

Because of the different mechanical properties of plastics, shredder cutting systems are often specifically designed to shred a particular material. For example, the cutting geometry of pointed knives has a positive effect when shredding extremely tough materials such as big bags, ropes or nets that have to withstand high tensile loads. Here, the force provided by the drive unit focuses perfectly on a very small area, with the cutting system shredding highly tear-resistant materials as if it were a

knife or scissors. On the contrary, flat knives have really proven their worth in terms of processing rigid plastics like polypropylene. Materials such as plates, crates, or plastics manufacturing residues (from extrusion, injection moulding, etc.) which are relatively thick-walled compared to fibres, can be broken down more easily over a parallel cutting edge. The knives operate over a large area and aggressively draw in material, and this, in turn, has a positive effect on throughput.

The choice of the right cutting system, or rather the interaction of rotor and stator knives and speed, also decisively influence particle quality. Here, it is particularly important to avoid fines in the material flow because they negatively affect downstream processes and can lead to blockages in cleaning components or the fine screens of extruders, for instance.

The above examples show how extensive this topic really is. The economic component in particular plays an ►



big bags



HDPE bottles



PP hollow parts

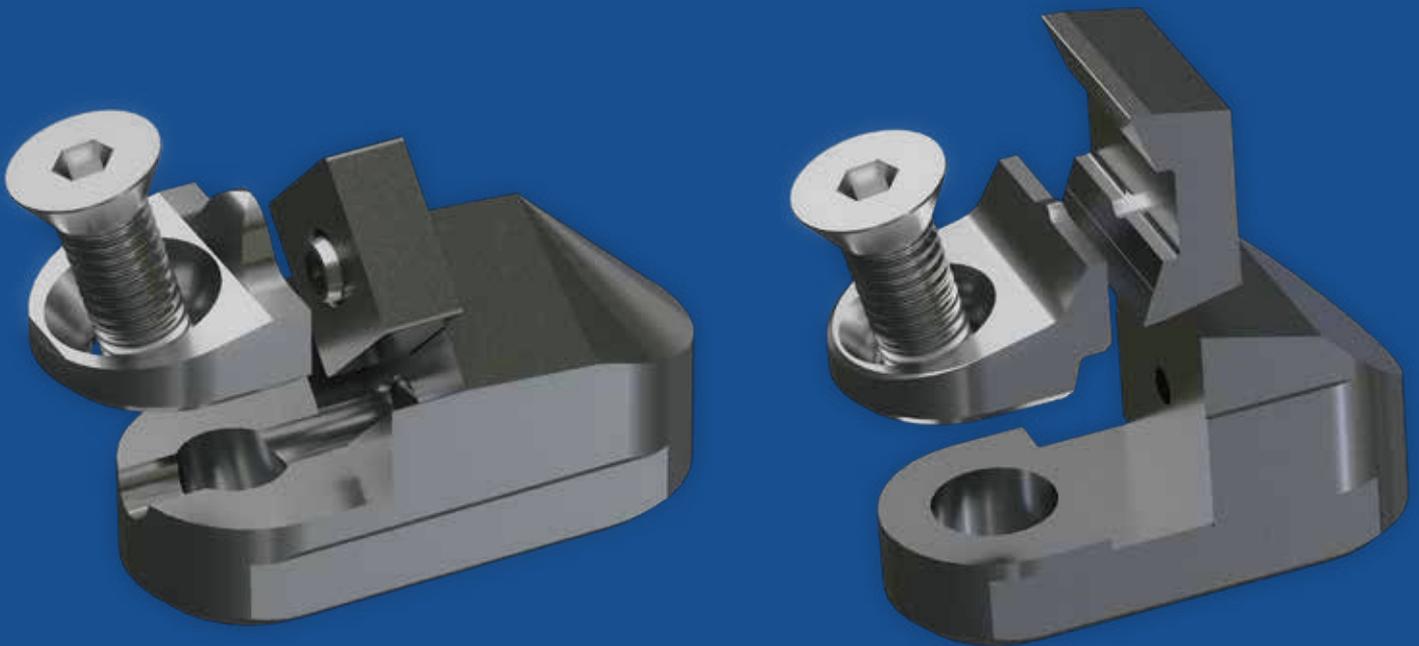
EXTENDING THE SCOPE OF SHREDDERS FOR PLASTICS RECYCLING WITH A FLEXIBLE CUTTING SYSTEM

important role here. It often happens that contract manufacturers have to accept other materials, such as lumps from production processes, along with the main material, which may be a film. Furthermore, several different types of waste plastics often have to be processed to fully utilise production capabilities. If a separate shredder is now used for each material stream – depending on the company's size and volu-

mes being shredded – it is difficult to demonstrate economic viability. For this reason, smaller batches are often sold on, which in turn reduces the overall productivity.

Lindner addressed this problem and turned the established Mono-Fix technology into a smart system. Thanks to the Mono-Fix – originally developed to minimise downtimes

during maintenance – knives and knife holders can be changed using just one screw. More modules have now been added to the existing system. Different pointed and flat knives are available, as well as cover plates and special counter knives that can be fixed to the same rotor body. This extended range now makes it possible not only to replace the cutting system completely in the event of wear and ▶



Knives and knife holders of the Lindner Mono-Fix system can be freely positioned on the rotor and changed with just one screw.

EXTENDING THE SCOPE OF SHREDDERS FOR PLASTICS RECYCLING WITH A FLEXIBLE CUTTING SYSTEM

tear, but also to use different or mixed rotor configurations. Mixed cutting systems can avoid common problems caused especially by difficult materials such as massive lumps and purgings because pointed knives would otherwise mill into the plastic, causing throughput to drop sharply. Combining the two systems produces particles that are precisely cut by the pointed knives, and the flat knives cut loose any milled-in material. Using special filler plates, the aggressiveness of the cutting unit can also be adjusted so that it is possible to shred heavy materials at corresponding throughputs even at low drive power. In addition to the flexible rotor configurations, customised software set-ups make it possible to tailor relevant machine control and frequency converter parameters to the respective application.

The turnkey packages can be ordered as material-specific options perfectly suited to the relevant application and shredder. In developing this solution, Lindner primarily relied on the application know-how acquired internationally over decades, because after all, the ideal shredder configuration for PP/PA ropes in Chile also works wonderfully on the coasts of Norway. ■



Mixed rotor configurations ensure hassle-free shredding of difficult materials such as massive lumps.

CONTRACT MANUFACTURER EXPANDS PRODUCTION CAPACITIES WITH APPLICATION-OPTIMISED SHREDDER TECHNOLOGY

Since 2001, Candi Plastic Recycling in Sollenau, Lower Austria, has been transforming industrial waste thermoplastics into premium homogeneous recyclates. As a contract manufacturer, the company relies on Lindner's shredders with flexible cutting units to ideally cater to customer needs.



Thanks to the shredder's flexible cutting system, Andreas (left) and Gheorghe (right) Campan from Candi Plastic Recycling can perfectly address customers' needs.

CONTRACT MANUFACTURER EXPANDS PRODUCTION CAPACITIES WITH APPLICATION-OPTIMISED SHREDDER TECHNOLOGY



Combining different knife geometries enables the machine to optimally adapt and shred a variety of plastics.

Plastic products manufacturers who wish to improve their products' sustainability have two options: Either build their own recycling facility or rely on an established expert. One of these experts is Candi Plastic Recycling GmbH. At the headquarters of the family-owned business, where dog Mia takes care of the group's security, about 3,000 metric tons of thermoplastics such as PE, PP, PS and ABS are turned into homogenous regranulate every year. The materials, which are processed south of the Austrian metropolis of Vienna, as well as at their subsidiary Calex in Baia Mare, Romania, mostly come directly from international big players in packaging and brand product manufacturing.

One of the secrets of the company's twenty years of success is its ability to constantly adapt to different materials and new customer requirements. Andreas Campan, Head of Production and Chief Technician at Candi Plastic Recy-

cling, explains: 'We process thermoplastics in almost every shape, from films to hollow bodies to lumps. Since more and more producers want to avoid waste as much as possible, the required purchase quantities are constantly increasing and with them the variety of different materials. To meet our customers' demands, and also to ensure our facilities are as productive as possible, we rely on technologies that enable us to cover the broadest possible material spectrum.' Specifically in terms of shredding, the company relies on Lindner's compact shredders for the first stage in the recovery process. The decision to buy from this manufacturer was once made on the basis of industry recommendations.

Today, Candi Plastic Recycling and Lindner are very much partners working together on smart solutions to tackle new challenges. 'We were looking for a solution that would allow us to process as many different

materials as possible with one single machine. This keeps the investment costs in check and ensures that we can exploit our full production potential. If these requirements are met, we can ultimately increase our sales. When we approached Lindner, they were immediately willing to help tackle this issue,' Campan explains.

The result of this cooperation is a flexible cutting system based on Lindner's tried-and-tested Mono-Fix technology. Thereby it is possible to quickly adapt the shredder to a wide range of materials. The different knife geometries and rotor configurations ensure consistently high outputs. Stefan Scheiflinger-Ehrenwerth, Head of Product Management at Lindner Recyclingtech, states: 'We always place great value on developing solutions together with our clients and paying close attention to our clients' specific needs. This approach has paid off once again in our collaboration with the great team at Candi.' ■

Lindner-Recyclingtech GmbH

Villacher Strasse 48 | 9800 Spittal/Drau | Austria
t.: +43 4762 2742 | f.: +43 4762 2742-9032 | office@lindner.com

www.lindner.com