



PETCORE

PET CONTAINER RECYCLING EUROPE

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PET pallet offers new possibilities for RPET market

Using its injection compression moulding technology, *remaplan*, located in Lindau (southern Germany), has developed an additive for recycled PET which makes it possible to manufacture Europallets with high tensile strength.

Mr Rüttbauer, director of *remaplan*, explains proudly that they have developed a blend based on 80% recycled PET which gives RPET great tensile strength, while at the same time preserving the excellent processing characteristics of PET. During the past two years, Dr Juergen Schniedermeier and Dr Peter Naday have assigned their management staff to developing this blend. The crowning glory of their achievement was applying for a patent for the blend. Dr Juergen Schniedermeier reports that more than 200 compounds had been tried and a great many tests carried out before this point was reached.

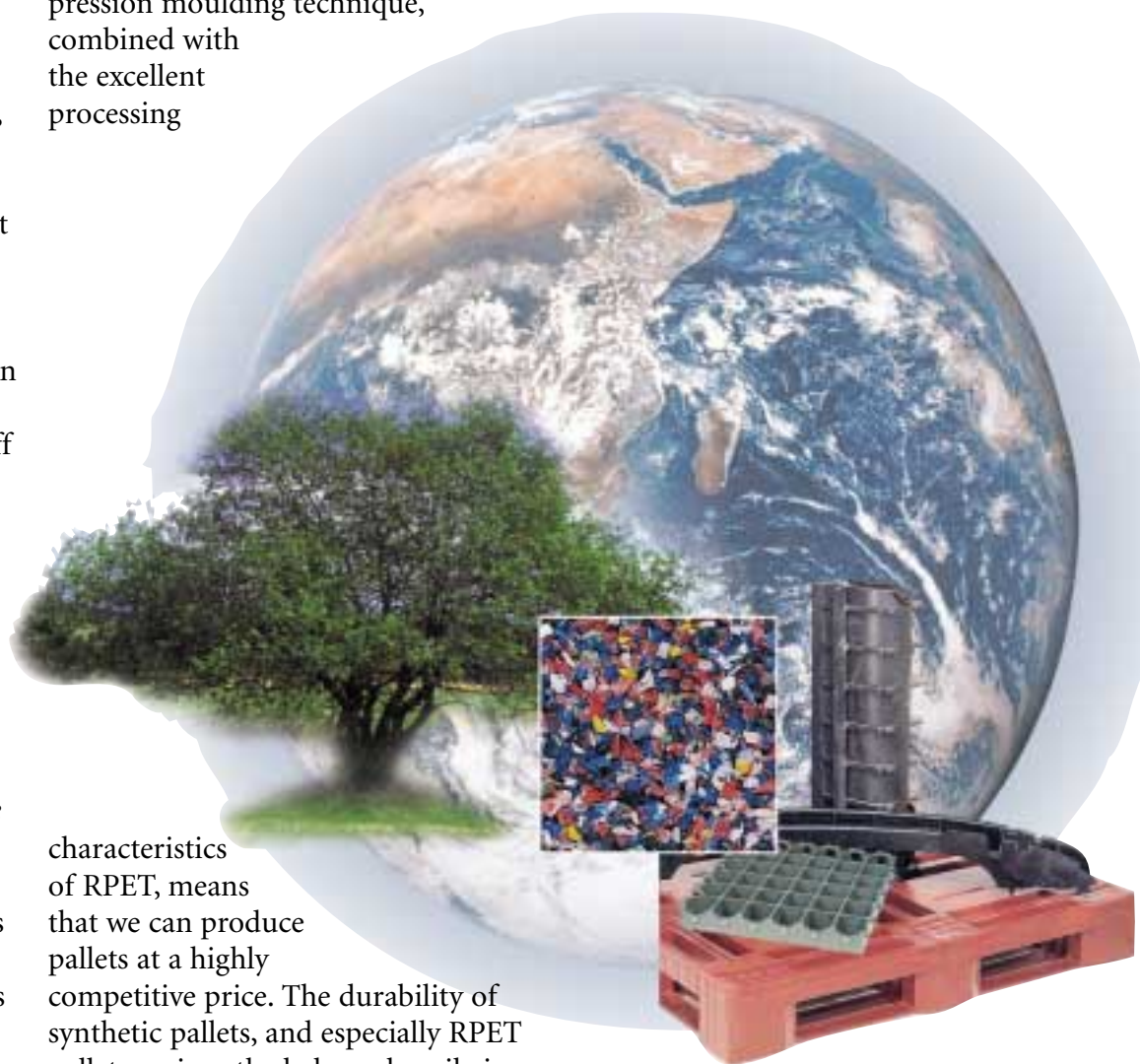
“Up to a certain point we have no problem with impurities”

A combination of factors determines the good processing qualities of RPET for applications such as pallets and bottle crates. Mr Rüttbauer explains, “Naturally, the first consideration is the end product. It has to be of good quality, but up to a point we have no problems coping with impurities. For instance, we can handle up to 5% PET-G without difficulty, and the same applies to several percent of the barrier substances polyamide and EVOH. Of course, plasma coatings have no effect. The colour of the material is irrelevant. It is possible to colour according to the customers request. Therefore, the new PET beer bottles don't present a problem. Our method of processing RPET is also a deciding factor. We apply the injection compression technique. Because of the short processing time

and low shear forces, the positive qualities of RPET remain intact. This, combined with the additive, ensures that a pallet can be produced that combines high impact strength with stability of shape. Mr Rüttbauer: “The injection compression moulding technique, combined with the excellent processing

Says Mr Rüttbauer: “With the new duo machine, we can approach the price of wooden pallets.” The future is looking good for *remaplan*.

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characteristics of RPET, means that we can produce pallets at a highly competitive price. The durability of synthetic pallets, and especially RPET pallets, swings the balance heavily in their favour. It is possible to produce around 340,000 pallets per year with the smallest machine, which amounts to 5700 tons of processed RPET. Obviously this re-presents an excellent new outlet for processing RPET, with the added advantage that the pallets can easily be recycled after use”

“It is possible to produce around 840.000 pallets per year with one duo machine”

remaplan has plans to develop a duo machine in the future, which will be able to produce two pallets in the same production time.

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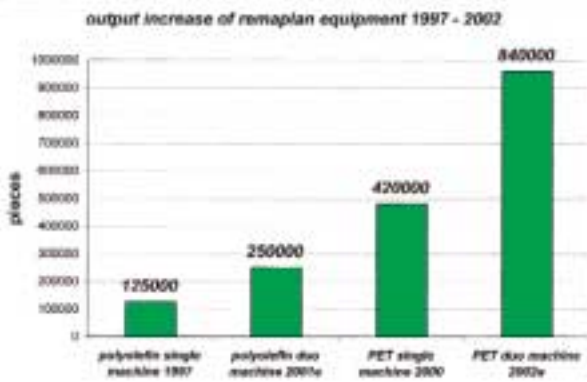
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PET bottle recycling in the UK
PETCORE at Brau 2000

PETCORE is a not for profit association with the aim of promoting the recovery, recycling and valorisation of PET containers in Europe. It is formed by the following companies: Altoplast-Claropac, BP/Amoco, Coca-Cola, Constar, Continental PET Technologies, Du PontSA, Eastman Chemical, Evian, Inca International, Kosa, Kulleborn & Stenström, M&G, Pechiney, Perrier Vittel, Rexam Beverage Packaging, Ryttylän Muovi Oy, Schmalbach-Lubeca, Tetra Pak, Wellman.

RPET Review giving a broad coverage of product and market development in the PET recycling industry is distributed in controlled circulation of 2500 copies.

RPET Review



The output of one duomachine can be 840.000 pallets per year

The introduction of R-PET pallets does not just depend on developing the technology, but also on the willingness and commitment of industry to change over to R-PET products. Only then will the additional investments needed, be justified.

remaplan company profile

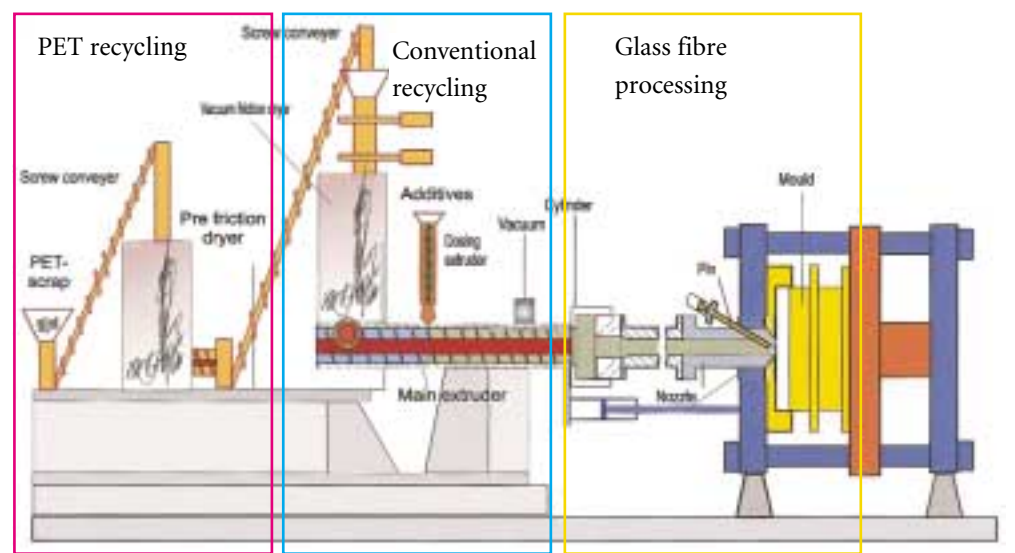
remaplan started 12 years ago, and is actually an engineering firm that has specialised in product development for injection compression technology. The basic philosophy of the company is "to produce end products from raw materials in one step." The specifications for the product are drawn up with the client. Then the equipment needed to make it is developed and also built by remaplan, thus offering a total package which the client can immediately put into production. remaplan have specialised in five product lines:

- Prime
- Inline recycling
- PET (high speed)
- Deko (SF)
- LFTM (glass fibre reinforced products)

50 percent of the machines the company produced in the last 12 years are for making pallets and bottle crates, and 50 percent of which were exported to the Far East. A number of glass fibre reinforced products were also developed for the automobile industry. It has been shown time and again that the determining factor in choosing remaplan technology is the favourable price-to-quality ratio of both.

PET - Inline Recycling by remaplan

The injection compression method has been adapted for processing RPET, this in contrast to the situation with regard to processing other materials. To process RPET, first a pre-friction dryer is first needed, which works under vacuum, thereby warming up and drying the material to a residual value of 50 ppm by its own friction. The extruder is fed by a vacuum dryer. The extruder then fills an injection accumulator, from where 11 kg of RPET are injected into the half open mould within 4 seconds. By immediately closing the mould using compression, the RPET is pressed into shape using significantly less pressure than normally needed for injection moulding (because of the relatively low pressure and temperature, the end product is hardly stressed, which adds to its quality). There is also a saving in production costs which can amount to 30%, compared to injection moulding. Because the matrix is cooled, the pallet can already be ejected from the mould within 30 seconds with 3 mm wallthickness. The total production time of an RPET Europallet is therefore considerably lower than for HDPE. This means a substantial increase in capacity.



remaplan injection compression machine chart

New PET and RPET applications

- Polywert is working in the industrial textiles sector –primarily with polyester- using residues generated by synthetic fibre producers and textile processors. This includes reprocessing it on suitable machinery and developing applications which best utilize the properties of the recycle products. Polywert is currently testing recycled PET bottles for further processing in Polywert ISOPET. A thermal insulating material based on Polywert FIBRE. For further information: <http://www.polywert.de/>
- In cooperation with Campina Melkunie, a German packaging specialist has developed the first PET bottle for fresh milk. As the bottle is resealable, it permits consumers to enjoy milk even outside their homes. The screw cap makes sure that no milk gets spilled when the PET bottle is opened. (source Food Marketing & Technology). For further information: <http://www.smallbach.de/>
- DaimlerChrysler built two vehicles in which many parts are made from recycled materials. These materials stem from bottles, foam, carpets and tyres. The CARE programme (Concept for advanced Recycling and Environment) is set to develop new concepts and production techniques using recycled materials for the two CARE models. The two Dodge Stratus contained more recycled plastics than planned for. For further information: <http://www.DaimlerChrysler.de/>

New brochure from PETCORE

'Guidelines for extrusion and injection moulding of PET bottle scrap'

PETCORE issues new technical guidelines for extrusion and injection moulding PET bottle scrap. This brochure gives detailed information on subjects as: crystallisation and drying, the extrusion and the injection moulding process for PET bottle scrap.

'Bottle recovery systems in Canada'

Three bottle recovery systems in Canada are analysed.

- Alberta - Deposit return system
- British Columbia - Deposit return system
- Ontario - Kerbside return system

The deposit system in Alberta has over 28 years of history. There are 220 return depots across the Province, which are owner-operated. There is no return to retail grocery stores in Alberta - returns are only through depots. The deposit system in British Columbia (BC) is the oldest deposit-return system in North America. There are 164 return depots across the Province, owner operated as well; consumers can return containers to grocery stores. The Ontario kerbside programme has been operating since the mid-1980's. The system provides service at kerbside to 90% of Ontario's 11,4 million population.

Both reports can be ordered at PETCORE: maggie@euronet.nl



Company profile: Synco mobile Compounding B.V.

The explosive growth achieved by Synco since its foundation in 1994 has continued through the first half of 2000.

In order to cope with this growth, it has opened a new branch in Finsterwalde, situated in the triangle between Berlin, Dresden and Leipzig. The company has rented a large hall measuring 4000 m² with a 10,000 m² storage site, on a disused airfield there. As is the case at Emlichheim, head office of Synco, a variety of plastic materials are processed at Finsterwalde, using the most up-to-date mobile and stationary grinders, and washing and drying equipment.

The philosophy behind the recycling of these plastic materials is very important. Director Diethold Mertz states: "We are not simply processors of crates, PET containers or pallets, but manufacturers of high quality raw materials. With the help of the latest technology and logistical support, we are able to offer our clients good quality raw materials at a favourable price."

"We are not simply processors of crates, PET containers or pallets, but manufacturers of high quality raw materials"

Until now Synco has recycled mainly bottle crates, fruit and vegetable crates, and plastic pallets. In the near future, they also want to concentrate on used plastic automotive parts, municipal refuse containers and dustbins, and on further developing the recycling of PET bottles. In view of a new EU directive on packaging and packaging waste, to be instituted by the middle of 2001, most probably making the collection and recycling of such bottles compulsory, the recycling of PET bottles will increase considerably. Synco also devotes much attention to increasing its activities in Eastern Europe, with subsidiaries



Crates and bottles are separated on location

in Poland, Hungary and the Czech Republic. Using its mobile recycling equipment, a variety of products are processed on site, i.e. ground down or compounded into bales. Jan van der Zant, who is director of the Dutch Synco Mobile Compounding B.V. branch and is also responsible for Eastern Europe, "In the past year we have processed around 12000 tons of HDPE crates as well as 2500 tons of PET bottles for (among others) Coca Cola, Pepsi Cola, Heineken and Interbrew in various countries like Poland, Hungary, the Czech Republic, Romania and Slovenia. Reusable PET bottles are generally used only once, as they are often used for storing other products such as oil and petrol, etc. Consequently the reusability is less than 2 and it should be 4 times. Secondly the consumers are paying a relatively high price (compared to their income) for the product and they therefore insist on perfect looks (no scratches etc.). However, they can easily be recycled, and the processed material is of good quality. The crates are ground and the material can be immediately used for the production of new crates."

Synco Mobile Compounding owns 12 mobile grinders and 2 mobile baler units. Says Jan van der Zant: "Our flexible deployment capability is one of our great advantages. We can process materials anywhere, and because of the compactness of the mobile units, they occupy very little space."



Jan van der Zant, Director of Synco Mobile Compounding B.V. and also responsible for the subsidiaries in Eastern Europe

RPET: MORE POPULAR THAN EVER

Pan-European market research into current and planned use of recycled PET (RPET) has revealed that RPET is now highly in demand and that its use is set to grow significantly over the next few years.

In a study commissioned by PET Container Recycling Europe (PETCORE) a representative sample of 76.000 end market users gave details of their current and future use of RPET. The conclusions of this study demonstrate that users across a range of industries are not just using RPET today, but are planning to do so more in the future, confident that future supplies of RPET will be sufficient to meet their specific needs.

The pan-European research programme was initiated to determine the attitude of decision makers in four key industry sectors: automotive, packaging, household appliances and building & construction. Interviewees, mostly purchasing managers and R&D managers represented companies located in Austria, Benelux, France, Germany, Italy, Spain, Scandinavia, Switzerland and the UK.

Key conclusions of the study indicate that throughout Europe, 7% of all companies interviewed currently use RPET. The largest number of users is in France (12%), the lowest number is in Switzerland (0%), where on the

other hand the largest number plan to use RPET in the coming twelve months. Around one third of all companies interviewed who said that they use pet or plan to do so, have made this decision based on the quality of RPET. The highest number of users (35%) use RPET for the production of bottles and containers - and 60% of these companies are confident that supplies of RPET will continue to be available in line with the rise in demand.

The study also took in the awareness of RPET. Overall, this is quite high, with 32% of all respondents indicating an awareness. This is highest in Italy (68%) and lowest in the UK (11%). Taken by industry, RPET awareness is highest in Packaging (42%) and lowest in the Building & Construction industry (22%). The largest discrepancy between RPET awareness (68%) and its actual use (4%) is found in Italy.

The study shows that smaller companies (as measured by turnover) are relatively more aware of the benefits of RPET - and also use it more.

Last year, nearly 220.000 tonnes of PET were collected and recycled throughout Europe. This year the total amount is expected to be in the region of 300.000 tonnes.



PET bottle recycling in the UK

RECOUP the English container recovery organisation in made a business report on the recycling of PET bottles in the UK in co-operation with PETCORE. The report begins with a review of the PET reprocessing process, with each operation described, suitable equipment identified, and operating requirements and costs reported. A SWOT analysis is used to identify factors relevant to a PET reprocessing operation. Consequently the factors are considered in more detail, providing an introduction to the issues associated with entry into the plastics reprocessing business. Business scenarios are then considered using information from both the technical overview and SWOT analysis.

Market overview

The level of plastic bottle collection for recycling has increased steadily in the UK over the last decade. The UK, however, lags behind the other EU countries in the recycling of plastic bottles. A total of 11.300 tons of plastic bottles were collected for recycling in the UK in 1999; including an estimated 4.500 tons of PET-bottles – less than 5% of the bottles used. Compared to the 70-80% of PET bottles collected in Sweden and Switzerland a very meagre figure. Globally around 17% of PET bottle consumption is collected for recycling, about 900.000 tons, with 219.000 tons (about 14% of consumption) collected in Europe, in 1999. Italy, France, Belgium and Switzerland account for 75% of the European total.

The principal barrier to the collection of post consumer plastic bottles for recycling in the UK, is the lack of funding to cover the cost of collection and sorting, activities generally carried out by local authorities in response to demand from residents. 41% of UK local authorities now include plastic bottle collection in their recycling programmes, with more than 2.8 million households (11.4% of the UK) served by kerbside collection of mixed recyclables including plastic bottles.

There are indications that the amount of plastic bottles collected for recycling in the UK will increase significantly over the next five years.

The UK government's Waste Strategy 2000 introduces statutory recycling targets for English and Welsh local authorities to meet national household waste recycling and composting targets of

25% by 2005, 30% by 2010 and 33% by 2015. Local Authorities in England and Wales achieved an overall recycling rate of 9,5% in 1998/1999 with only one in three Local Authorities recycling more than 10%.

Results SWOT analysis

Strengths

- UK post-consumer bottle collection infrastructure is expected to increase, with more PET bottles being recovered for recycling.
- Shortages of PET recycling capacity are predicted for the UK within the next couple of years.
- UK local authority plastic bottle collection schemes may have environmental policies, which encourage them to use local (UK) reprocessors.
- The UK market for virgin PET packaging is one of the largest in Europe, the UK has only one indigenous reprocessor, which has limited capacity, due to a lack of collected bottles.

Weaknesses

- If the predicted growth in UK collection of post consumer PET bottles does not occur, competition for collected material will drive costs up and may force out marginal processors.
- A newly established business may be disadvantaged relative to existing reprocessors with regard to supply of post-consumer bottles, due to existing business relationships/contracts.
- The economics of recycling used plastics packaging sourced in the UK are supported by the value of the Packaging Recovery Note (PRN) which is difficult to predict.
- A UK based reprocessor may incur higher transport costs for material from mainland Europe than reprocessors on the continent.

Opportunities

- The amount of PET used in packaging is increasing rapidly, PET is taking market share from glass and PVC.

- New markets for recycled PET are being developed, allowing recycled PET to be sold into high value volume markets.
- A new reprocessing plant equipped with the latest reprocessing equipment should give technical advantages over reprocessors using older equipment.
- Environment Agency accredited reprocessor status will enable PRNs to be issued against material reprocessed.
- Demand for PRNs is expected to exceed supply in 2001, driving PRN value upwards.
- The Waste management Strategy will increase the number of local authority collection schemes for recyclables.

Threats

- Commercial competition from UK and overseas reprocessors for post-consumer PET bottles (mechanical and chemical recycling) may drive up the cost of post consumer bottles.
- 'Non-standard' PET bottles which are generally incompatible with existing PET reprocessing may gain market share, driving up reprocessing costs.
- The cost of virgin PET may fall, reducing achievable sales values.

Conclusion

Although more detailed analysis should be considered preliminary investigations of the conditions relating to the establishment of a new PET bottle reprocessor in the UK supports the view that the potential exists for a profitable business.

The report 'PET recycling business plan' is available at PETCORE. Please order by email: maggie@euronet.nl

COLOPHON

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We will be pleased to send you the newsletter in the future.

<http://www.petcore.com/>

PETCORE at Brau 2000, Nürnberg, Germany

PETCORE held a stand on the Brau 2000 exhibition which was held last November. The stand was organised together with PET planet (PET magazine). The total PET planet complex was exhibiting a broad variety of PET related companies on a total surface of around 450 sqm. PETCORE welcomed a lot of interested people from various businesses and handed out a lot of her brochures on design and technical aspects.

