

Part II

Background and evidence

3 Background to the RTP industry

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Introduction

3.1. The operations of Linpac and Paxton overlap principally in the area of plastic RTP. There are various definitions of RTP. At its widest, the term embraces large bulk containers and pallets, bottle crates and a wide variety of products for use in various forms of industry. Other definitions focus on RTPs that can be lifted by hand, usually with a footprint of up to 600mm × 400mm. This chapter describes the types of RTP that are most relevant to the inquiry, the manufacturing process and the demand for RTP.

3.2. We have received information on this industry from the main parties, some of their customers and competitors who have given us evidence, and from Retail Planning Innovations, a management consultancy specializing in the retail industry that we appointed to advise us on the RTP industry.

RTP business processes

Introduction

3.3. RTPs are plastic containers that are used to transport items from manufacturers or producers to retailers or other end users, and are then returned when empty for cleaning and reuse. RTPs take a number of forms. Many of them are designed to stack on top of one another when full, so that transit space can be fully utilized when goods are being distributed, and the maximum use made of display space in stores. Once the RTPs have reached their destination and their contents have been unpacked, the focus then shifts to reducing the amount of space needed for storing the empty containers and for transporting them on their return journeys.

3.4. RTP is generally considered to be more environmentally friendly than traditional forms of packaging including card or board. For example, supermarket RTPs may be reused up to 300 times over a five-year period and can then be recycled. Plastic RTP has the advantages of low weight, durability, shape versatility, economy and quietness in use.

3.5. The European Commission Directive on Packaging and Packaging Waste is aimed at reducing the impact of packaging waste on the environment through a combination of source reduction, reuse and recycling. In Germany, this has resulted in legislation setting out minimum percentages for the recovery of packages and for the recycling of the recovered material, which in turn has led to high levels of use of RTP. In the UK, which is the second largest user of RTP in the EC, current policy is targeted at economic incentives to reduce landfill and encourage recycling. Users of packaging, including retailers, pay landfill taxes that are reduced by recycling board and plastics through an authorized recycler or reprocessor.

3.6. The use of plastic RTP in the UK started with bakery trays and bottle crates in the 1960s. Marks & Spencer was the first multiple retailer to use RTP in 1969. However, RTP did not develop significantly until the 1980s, when supermarkets including Tesco and Sainsbury's began to use it to transport produce. Usage then expanded through the 1990s into other supermarket areas and into other sectors including manufacturing, distribution of spare parts and office moves. In the mid-1990s dedicated centres were set up to handle the washing and storage of RTPs. Varying crude oil prices and subsequent changes to plastic resin prices have impacted on the competitiveness of plastic RTP, generally increasing its attractiveness in recent years.

3.7. Whilst the footprint of the standard plastic tray has changed little over the past 15 years, the other dimensions and shape have. The first RTPs could be stacked but did not nest within each other when empty. Later developments enabled a 40 to 50 per cent nesting, and more recently trays have been developed that allow a 75 to 80 per cent nesting. This reduces the return space and hence the transport cost. A simple wheeled plastic device called a dolly has been introduced to carry containers more efficiently than the metal cages previously used by most retailers.

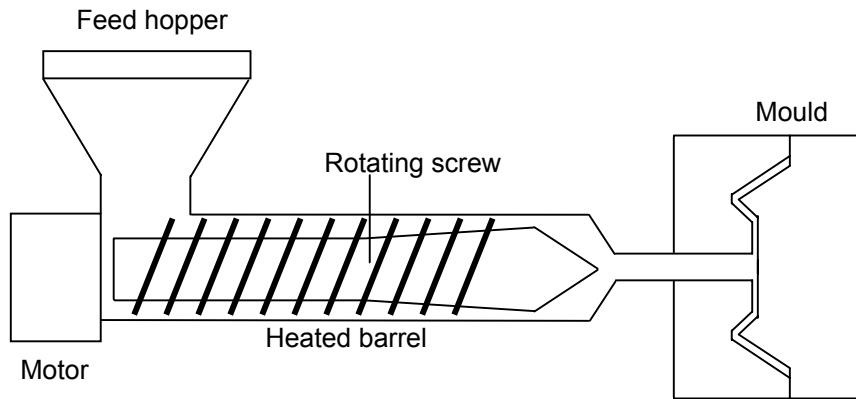
Manufacturing of RTP

3.8. RTP is generally manufactured using injection moulding. Plastic is melted in an injection-moulding machine (see Figure 3.1). A rotating screw moves backwards and forwards in the barrel. As the

screw turns, melted plastic accumulates ahead of the screw. When a sufficient volume of melted plastic is accumulated, the screw stops rotating and is driven forwards mechanically, injecting the plastic through a nozzle into the mould. The newly-formed RTP is then cooled, and when it is cool enough to maintain its shape without distortion, the mould opens and the RTP is ejected.

FIGURE 3.1

Injection moulding machine



Source: *Plastics Packaging Technology*, Susan E M Selke.

3.9. An alternative manufacturing technique, rotational moulding, is sometimes used for short production runs. However, injection moulding is the main technique used in the RTP industry.

3.10. The plastics used for injection moulding typically have low viscosities and high melt flow rates at the injection temperature. These properties achieve the rapid mould filling required. There are many variants of the principal polymers to suit the intended use of the RTP, for example, RTP for food transport needs to be washed to achieve a high level of hygiene, and some plastics are more suitable for this purpose than others. The plastics usually used are either polypropylene or high-density polyethylene. The choice of which plastic is used will depend on the intended use of the finished product. Generally, polypropylene is chosen.

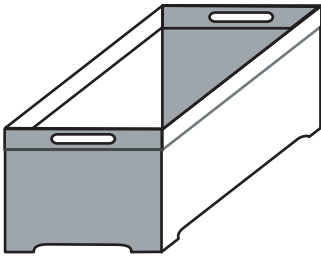
Design and development of RTP

3.11. The types of RTP that are most relevant to this inquiry are shown in Figure 3.2. Options can include external dimpling of the surface of the RTP to allow easier removal of shipping labels and reinforced nylon bale arms for added strength. In addition, either attached or loose fitting lids are available with some types to provide extra protection and security for the products being transported. Attached lids are normally in two parts that swing to close the top of the RTP. The lids are closed when the RTPs are stacked, and the lids swing to the side to allow the containers to nest within each other. Attached lid RTPs are more expensive to manufacture than other stacking and stack-nest RTPs.

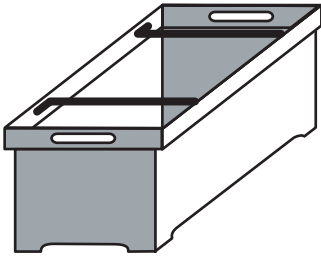
3.12. Most RTPs can be stacked or nested with RTPs of the same type, even if they are from different manufacturers. However, nested RTPs can sometimes stick together when nested. This is due to very slight differences in the dimensions ($\pm 0.2\text{mm}$), which can be caused by their being manufactured from different machines/moulds (either by the same manufacturer or different manufacturers) or even by cooling at different rates, when produced by the same machine/mould. The problem is most noticeable on deep nesting RTPs that nest by at least 70 per cent, and is a particular issue when the RTPs are used in automated filling or washing processes. The problem can be overcome by carrying out development trials to ensure the products consistently meet the required tolerances.

FIGURE 3.2

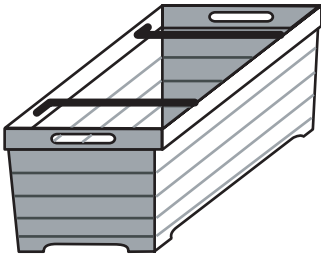
Types of RTP



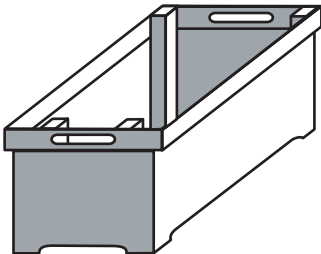
Stacking. These RTPs are used widely in the retail sector in mainland Europe, particularly in countries with relatively short distances between producers and consumers. They have straight, fixed sides and this maximizes the cubic load that can be carried. They have the disadvantage of requiring more space when empty, increasing handling costs.



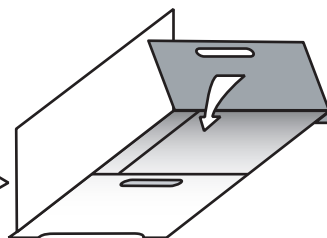
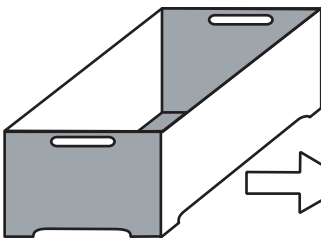
Stack-nest. RTPs nest within each other when empty, or stack on the bale arms when full. The sides are sloping to allow nesting. Widely used in UK. Two particular types of stack-nest RTP are illustrated below.



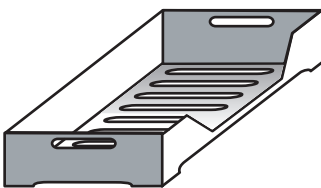
Maxi-nest. This is based on a design that Paxton developed with Tesco. The Maxi-nest uses stepped sides to increase the loading capacity, as compared to a standard stack-nest RTP. The design has been widely adopted in the UK supermarket sector, although other countries in Europe remain committed to folding and stackable RTP.



180-degree stack-nest. Units nest within each other when empty, or stack on each other by rotating alternate units by 180 degrees. These RTPs can be difficult to handle if filled with heavy products because they require correct alignment to allow stacking.



Folding. These units have straight sides that can be folded down to minimize storage space and transportation costs when empty. They are usually more expensive than other types of RTP. They are widely available throughout mainland Europe and are used where transportation distances are relatively high, for example cross-border movements and within Germany and France.



Bakery trays and other specialist designs. Many variations on the above standard RTP designs are needed for specific uses. Bakery trays are used for primary and secondary distribution and are also used for point of sale display in some retailers. Bottle crates have openings on the side to serve as handles and plastic partition walls inside to separate the bottles. Other examples of specialist designs are thermally insulated frozen food RTPs and RTPs for fresh fish which do not have holes as they contain ice and water.

RTP operation

3.13. Use of RTP has an impact across the supply chain of many companies. For example, use by supermarkets has implications for growers and manufacturers, packers and processors, logistics companies, and washing equipment operators.

3.14. In the UK approximately half of the RTPs in use by supermarkets are owned and managed by service providers which operate as logistics companies on the supermarkets' behalf. These companies move goods between the regional warehouses of the supermarkets and their stores using RTP, then collect the empty RTPs from stores, wash them, and return them to the warehouses or suppliers for reuse. The use of services providers by the supermarkets is becoming increasingly significant.

Size of the market

3.15. The market for plastic RTP can be viewed in the context of the wider packaging market. Total packaging sales in the UK in 2000 were £11.6 billion. £3.4 billion, or 30 per cent, of the total was plastics packaging, second only to paper and board in terms of market size.¹ Within the plastics packaging category, in 1999 £411 million was in the category of plastic boxes, cases, crates and similar articles.² This includes RTP as well as other products such as industrial cages and pallets, and bulk containers. There is no generally available published information about the size of the UK market for RTP. Estimates given to us have ranged widely up to £145 million sales a year. Part of the difference between these figures can be explained by the difficulty of defining the range of products that are subsumed within the generic title of RTP.

3.16. Elsewhere in Europe the RTP market is driven by the use of returnable bottles. It has been estimated that in 2000 there were over 600 million RTPs in use within the supermarket retailing, dairy, bakery, brewery and soft drinks industries across nine countries in Europe including the UK (see Table 6.1). 75 per cent were used in the transport of returnable bottles of beer and soft drinks, 18 per cent for supermarkets, and 7 per cent in bakery and dairy. Germany is the largest user with around 62 per cent of total RTPs, followed by the UK with around 8 per cent.

Demand for RTP

3.17. The main sectors using RTP are:

- (a) Retailers, principally supermarkets, for their primary distribution (from producer or manufacturer to wholesaler or regional distribution centre) and secondary distribution (from the regional distribution centre to the point of sale) and point of sale display of products. Main product categories include fruit, vegetables, meat and poultry, chilled provisions, frozen food, dairy, and certain non-food items including health and beauty products, clothing, music and videos, perfumes, and books and magazines. RTP is a significant source of cost savings for the supermarkets, both in terms of savings on expensive cardboard cartons (which can cost between 50p and £1 each plus disposal costs), and in terms of reducing the significant costs of moving goods from the back door of the supermarket to the shelves. Retailers are also now using RTP for home delivery of groceries that are ordered on the Internet and delivered in specialist vans, capable of maintaining different products at different temperatures, to homes.
- (b) Bakeries, for direct delivery to retailers and point-of-sale display of bread, buns, pastries, etc.
- (c) Dairies, for home deliveries and distribution to smaller retail outlets. There has been a decline in demand for RTP as more milk is sold through multiple retailers.
- (d) The fishing industry for moving fish and ice often direct from the boat to the wholesaler or retailer without further packaging.

¹Packaging (Plastics), Key Note Publications Ltd, 2000.

²Packaging Materials, Office of National Statistics, 2001.

- (e) Manufacturing industries, for the supply of components and distribution of spare parts to dealers. Many automotive parts warehouses are automated, and items are packed into RTP.
- (f) Horticultural companies, for distribution from farm to wholesalers, markets and smaller retail outlets.
- (g) Office removal specialists, for storage and relocation of papers and light equipment.
- (h) Breweries and soft drinks manufacturers, for delivery to pubs, restaurants, clubs and wholesalers with returnable bottles.

3.18. In supermarkets where usage levels are intensive, RTPs last for about five years for fixed-side designs and three years for folding designs. In other applications they can last much longer: up to ten years or even beyond.

Future developments

3.19. Although the progressive introduction of landfill taxes in the UK and other new environmental legislation might lead to higher demand for RTP in the longer term, for the immediate future it is likely that increased use will continue to be based on operational efficiency in use more than environmental incentives. Further efficiency gains that may lead to increased use of RTP include the introduction of electronic tagging. Each RTP would contain a microchip that would enable automatic checking and monitoring.

3.20. The use of RTP could also grow incrementally through extension of use into some new product lines and adoption of the system by retailers and other companies that currently use other packaging methods. However, there are limits to its expansion. For example, for products which are packed automatically using board trays and shrink wrap, it is unlikely that RTP will reduce operational costs unless machine systems are developed that can pack RTPs as efficiently as shrink wrapping.

3.21. The use of folding-side RTP, widely used in mainland Europe, may increase in the UK. These RTPs have the advantage of lowest transport costs when returned empty, and with some product development they may overcome issues around the difficulty in folding and unfolding, and the relatively short life expectancy.