

Prevent & Save

Packaging Optimisation Toolkit

A Packaging Guide
for Small Business

www.repak.ie/preventandsave



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Packaging in Context

Packaging is an essential part of our daily lives. Packaging is required to contain, protect and preserve products, make them easier to transport and carry, provide the customer with information on a product and enhance the sales appeal of that product.

The challenge for a business is to use the correct packaging relevant to the product which it surrounds. This means that an understanding is required of the packaging process, the functions packaging fulfils, and what happens to packaging once it has been removed from a product.

Current legislation requires that packaging should be designed to use the minimum amount of material consistent with fulfilling the functions of packaging, and in such a manner as to facilitate reuse, recycling, recovery or disposal of packaging. Therefore, the minimum amount of packaging used in the first place will lead to the minimum amount that will eventually have to be managed as waste.

Packaging is not only the material surrounding a product sold to the consumer, it may be:

Primary - surrounds the product sold to the consumer.

Secondary - collates the sales units for ease of handling.

Tertiary - facilitates handling and transport of a number of sales units or collated sales units.

Section 2 will discuss these terms in greater depth.



Introduction



The Packaging Waste Prevention Programme

Though Ireland's performance in increasing packaging recycling rates in the twelve years since Repak was established has been outstanding, there is now an increasing emphasis, both within Ireland and across Europe, to allocate resources to the prevention of packaging waste and a reduction in the use of packaging, where possible.

The Packaging Waste Prevention Programme (PWPP) is part of the National Waste Prevention Programme and has been co-funded by Repak and the Environmental Protection Agency (EPA) with the support of the Department of Environment, Heritage and Local Government (DoEHLG).

The aim of the programme is to assist Irish businesses with positive and practical ways to reduce packaging and to promote those achievements to a wider audience.

Apart from developing these specific measures within the Packaging Waste Prevention Programme, Repak is working very closely with the Irish retail sector.

The programme measures include studies, publications, seminars, best practice initiatives and the Repak Recycling Awards, which highlight examples of how Repak members are implementing Prevention Initiatives and including waste prevention as part of their normal operations.

Other measures of the programme include the development of a 'Packaging Waste Prevention Training Course' and the compilation of this 'Packaging Improvement Toolkit'. Both of these measures are designed to equip participants to make significant changes in their own companies with regard to excessive packaging where it exists.

Apart from developing these specific measures within the Packaging Waste Prevention Programme, Repak is working very closely with the Irish retail sector and other specific sectors within the manufacturing industry to

examine ways of preventing the growth of packaging and to reduce the amount of packaging waste going to landfill. The aim of this co-ordinated approach is to encourage all key players to optimise their packaging systems and to provide them with the tools to allow them to achieve this.

There are already economic incentives to reduce excess packaging. Businesses are consistently looking to reduce their product costs while Repak's "pay by weight" fee structure is designed to discourage companies from producing excess packaging.

The challenge now facing business is to achieve a balance between reducing the volume of packaging used while still serving customers needs. We hope that this toolkit will show some of the methods that can be used to address this challenge.



Repak and Packaging Waste Prevention

As well as helping Irish businesses to recycle their packaging, Repak is committed to reducing the amount of packaging placed onto the Irish market. This will also help to increase the packaging recycling rate in Ireland that Repak is measured against.

This recycling rate is derived from the amount of packaging material recycled by Irish businesses and consumers, divided by the amount of packaging waste arising onto the market. Both figures are measured annually.

$$\text{Packaging Recycling Rate} = \frac{\text{Packaging Material Recycled}}{\text{Packaging Waste Arising on Irish Market}}$$

In the last few years, there has been a lot of emphasis on increasing the amount of packaging material recycled. However some of the gains made with this strategy have been off-set by a corresponding increase in the amount of packaging waste arising on the Irish market. The best way to increase the Packaging Recycling Rate is to continue to increase the amount of packaging material recycled, while at the same time, decreasing the amount of packaging arising on the Irish market.

Repak also recognised that to reduce the amount of packaging arising onto the Irish market, businesses must fully understand how their packaging works before they can recognise what could be removed or minimised. To this end, Repak initiated a Packaging Technology Service in 2007.

Packaging Technologists are now available at Repak to advise members on the use of packaging materials, ways to optimise packaging throughout the supply chain and ways of managing packaging once it is no longer required. This is communicated through site visits, publication of newsletters and case studies and the provision of various tools to help members optimise their packaging and reduce their packaging waste.

The publication of this toolkit is another step in this communication process. The booklet explains the background to packaging waste prevention and



minimisation, discusses the importance of packaging and suggests an improvement strategy for business to use when optimising their packaging.

At the back of this booklet are a number of 'Prevention Tools' which can be used to optimise packaging or reduce packaging waste. The tools are presented in a generic way, so that businesses can consider if a tool is suitable for them or not.

At the back of each toolkit example there are a number of case-studies which show how such tools have been employed by various businesses in recent times. Where possible we have tried to include a variety of methods and packaging materials and have also included examples involving primary, secondary and tertiary packaging. These examples will be available on our web-site www.repak.ie/preventandsave and will be added to periodically.

2 Packaging Terminology



Understanding Packaging Related Terms

Primary Packaging

Primary or sales packaging is that which surrounds a product when sold to a final consumer. It is the packaging that is most often seen by the consumer and that of which they are most conscious. Primary packaging is also in direct contact with the product which adds complexity in terms of food safety requirements, hygiene requirements, etc.

Primary packaging also includes packaging material that is included with the primary pack, such as a label on a jar, a cardboard sleeve on a tray, or a lid on a bottle. Primary packaging is also the packaging that the consumer will retain the longest, so it normally has the most information on it in terms of contents, branding, 'Best Before Date', instructions for use, etc.

Secondary Packaging

Secondary or grouped packaging is that which is used to collate primary units for ease of handling in the selling environment. Typically this packaging can be cardboard boxes or trays, or shrink-wrapped plastic packs containing a number of primary units.

Variations include shelf ready packaging which can be placed directly on a shelf in a supermarket for a consumer to pick from, or carry-out packaging such as a cardboard carry out case for multiple bottles of wine so that the consumer can carry the pack away.

Tertiary Packaging

Tertiary or transport packaging is that which is used to facilitate handling and transport of a number of secondary packs in order to prevent handling and transport damage.

Typically this packaging can be pallets, stretch-wrap plastic film or shrink-wrapped plastic hoods. This type of packaging could also include additional items such as cardboard corner guards, layer pads or pallet caps.

Consumer Packaging and Industrial Packaging

Consumer packaging is designed to attract a consumer in a retail sales environment. Alternatively, industrial, or business to business packaging is designed to deliver

goods from one manufacturer to another. By its nature, industrial packaging will not be as prominent as consumer packaging and may be easier to change, as long as the product it contains does not become compromised.

Packaging Optimisation

In order for packaging to be optimised, primary, secondary and tertiary packaging must be considered as a total packaging system. Reducing one type of packaging is futile if a corresponding increase is required in another. For example, reducing the thickness of a primary plastic tub is meaningless if the secondary cases that the tubs are packed in need to be strengthened to prevent the tubs from being crushed.



3 The Functions of Packaging

Understanding what packaging is intended for is essential if packaging is to be re-designed

Containment:

The kind of packaging needed to contain a product depends on the physical form of the product and the nature of the product itself. Products come in all shapes and sizes and they also react in different ways to their surroundings. For example, a corrosive chemical needs to be contained in a pack that does not allow the chemical to leak, react with its surroundings, react with its packaging or become contaminated. All need to be considered before designing or modifying the type of packaging used.

Providing Information on a Product:

This means communicating information on a pack to a consumer. As well as helping to identify and market the product, there may also be legal requirements as to the information a pack must contain. These vary from industry to industry, depending on the nature of the product being packaged.

Preservation:

The preservation function in this context means stopping or inhibiting chemical and biological changes. The most common examples would be extending the shelf life of a food product beyond its natural life, or maintaining sterility in food or medical products. Preserving a product requires understanding of the conditions beyond which unacceptable deterioration may occur. Therefore limits must be established so that packaging can be designed to preserve a product to an acceptable level within these limits.

Protection:

The protection function in this context means guarding against physical damage. This could arise through shock, vibration or compression damage. Although corrugated cardboard boxes used for distribution packaging is the most recognisable example of protection against these hazards, there are many other pack types that could be employed to protect against physical damage. For example, paper pulp moulded packaging or plastic blister packaging can also be used to cushion a product.

Convenience for Handling:

This means all aspects of the movement and use of the product from the packaging line to final use and disposal. Handling a single product, groups of products and pallet loads etc. must be considered, as well as various transport methods, handling techniques, and storage conditions.

Sales:

As well as communicating factual information, a pack must be effective in promoting the contained product. This can be done by showing the product, using illustrations, branding the product name or the company that manufactures it, as well as using enticing pack shapes, colours, designs, etc. These complementary skills are normally the preserve of the sales and marketing team.



4 A Packaging Strategy



This chapter discusses the various steps in implementing a packaging improvement strategy, from obtaining management commitment before you start, to refining the strategy once you have implemented it and learned from it.

Following the steps in this chapter will allow you to select the most appropriate tools to help you implement a packaging improvement strategy.

The following are the steps in the strategy:



1 Management Commitment

The initial step in a Packaging Improvement Strategy is to **ensure a top-down approach**, with management willing to drive the initiative.

The success of any improvement strategy is dependent on the commitment of senior management. Without this, the resources required to execute the strategy will not be available, thus impeding potential improvements set forth in the strategy.

The main objective of this strategy is to find optimum levels for packaging materials, which in turn will reduce packaging costs

This brochure will concentrate on packaging weights and outline methods of measuring and reducing such weights. This is a simple and practical way of improving packaging at the moment but in time there may be other methods available that relate to measures such as air miles or carbon content for example.

Cost savings will encourage management commitment





2 Designating a Project Manager

The project manager is **the person who will drive** the Packaging Improvement Strategy.

This key team member will hold responsibility for;

- Surveying the existing packaging systems and calculating the weights involved,
- Prioritising the systems to target,
- Selecting the appropriate tools,
- Optimising the primary, secondary and tertiary packaging,
- Championing the investment required,
- Tracking the projects progress.

The project manager must decide whether the functions of packaging are being fulfilled in any packaging system. As material is removed from the packaging system, it becomes more difficult for the remaining material to fulfil these functions of packaging. Good judgement and experience in this area can make the changes smoother. Packaging material suppliers and packaging machinery suppliers can add useful expertise in these areas.

Repak can also offer advice if required.

The Project Manager is also responsible for evaluating priorities.

For Example, does the packaging system require:

- Cheaper Packaging
- Less weight
- Simpler materials
- More Recycled Materials
- More Recyclable Materials
- Packaging from a nearer location
- Less Embedded Carbon
- A more positive Public Image



3 Surveying Existing Packaging Systems

The purpose of the packaging system survey is to **quantify the weights of packaging** used in a packaging system.

All primary, secondary and tertiary packaging that contributes to a final product should be considered. The output of such a survey should be a finished product packaging weight, derived from all materials used in the packaging system. This is required so that when components of the packaging system are altered, the net effect on the total packaging system can be deduced.

Such a survey is equally valid on packaging products coming into a business (input packaging), or leaving a business (output packaging). Ideally when packaging in one system has been optimised, the other should also be examined for opportunities. For example, if the output packaging has been optimised, the way that packaging is initially delivered should also be examined so that the input packaging can also be optimised.

By comparing this packaging system weight to the weight of product it contains, a 'Packaging Ratio' can be calculated, showing the efficiency of the packaging system. An example of such a calculation is shown at the end of this chapter.

The underlying principal of the survey is to gather as much information as possible, so as to ensure that informed decision making can take place leading to a sustainable project plan.

The most important part of the survey is the product weight and packaging weight calculations

Product weights should be available from documentation such as sales sheets or product into and out of the company's warehouse. Net weight is the preferred option as this relates strictly to the product, where packaging weight is accounted for separately.

Packaging weights are commonly stored on spreadsheets or databases and are often required to provide information on a company's packaging to customers, suppliers, local authorities and Repak.

Quantities of units sold in a particular period (e.g. annually) may also be required to show the absolute amount of product or packaging placed on the Irish market in such a period.





4 Identifying the Target Areas

Knowing the target areas allows the strategy to begin with the implementation of 'quick win' projects.

The following should be considered when identifying the target areas:

- Which packaging designs have not been reviewed recently?
- What items are made or imported with the most amount of packaging per product?
- Where are the packaging return or re-use opportunities?
- Which suppliers (machinery / material) can I work with to reduce packaging waste?
- Where are the areas where most packaging waste is produced on-site?
- What are the products with the highest production volumes?
- Do I use packaging materials my customers cannot recycle?
- Do I receive packaging materials my business cannot recycle?
- What are my competitors doing to reduce packaging waste?

Once target areas are identified, they can then be prioritised. The first projects to be tackled should be the ones that:

- Reduce the largest amount of packaging waste
- Are the easiest to implement
- Produce the largest amount of cost savings

It is possible that any specific project will not meet all three criteria above, but it is worth bearing them in mind when deciding on which projects to implement first.

Lower priority projects should not be forgotten, as circumstances may change in the future which could make these projects more attractive. Working through a priority list is a good way of seeing where you are in an improvement strategy. When the strategy is reviewed, the projects on this list may move up or down in priority, but will not be forgotten.

Once target areas are identified, tools can be chosen to help implement the projects.



5 Selecting Appropriate Tools

Use the **most appropriate tools** at the back of this booklet to reduce the identified packaging waste

One of the difficulties with a Packaging Improvement Strategy is being clear about what an improvement is. There are many contradictions to be found in the choices available and decisions have to be made with regard to what is appropriate for a business. For example, some or all of the following could be important:

- Reducing the weight and volume of packaging placed on the market.
- Making packaging more recyclable.
- Reducing the carbon footprint of products or packaging.
- Using more recycled content in the packaging.
- Using biodegradable materials in the packaging.
- Reducing the hazardous content of the packaging.

While all of these are admirable goals, one has to watch out for possible dilemmas that these goals could cause. For example:

- Reducing the weight of packaging results in the use of lighter packaging materials, particularly plastic. Some types of plastic material are still more difficult to recycle than traditional materials such as cardboard or steel. Thus, reducing the weight of packaging can sometimes make the packaging less recyclable.
- Recycled packaging materials can sometimes be heavier than new materials when performing a similar function. For example, recycled cardboard liners are normally heavier than new cardboard liners in achieving comparable compression strengths. As a result, using a higher recycled content may mean increasing the weight of your packaging.





6 Implementing the Strategy

With all the planning complete, and the appropriate tools selected, the Packaging Improvement Strategy can be implemented across your business.

- Businesses may use biodegradable materials to improve the environmental performance of their packaging, but some of these materials can contaminate recycling streams if they are not segregated and disposed of properly. Although the material may be biodegradable, it could be less recyclable.
- When selecting the tools available at the back of this booklet, any undesirable outcomes should be considered as described above. The impact of the tools on primary, secondary and tertiary packaging should also be considered as described in Section 4.3.

With the tools most suited to your business identified, a Packaging Improvement Strategy can be implemented.

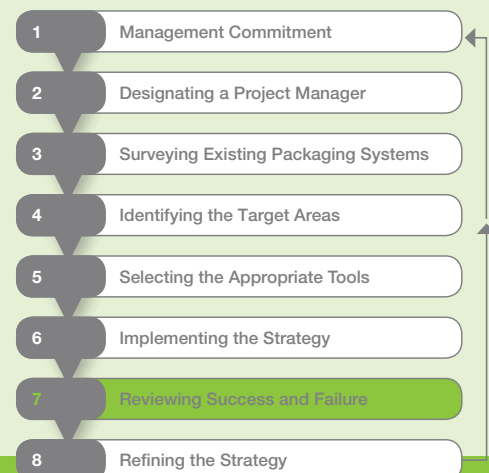
Knowing what is to be achieved will allow it to be measured. A Packaging Ratio as described in section 4.3, is one way of doing this but there are others. Concepts like 'Packaging Prevention' and 'Packaging Reduction' are difficult to quantify, so it is important that you understand what the current situation is with regard to packaging before you 'prevent' or 'reduce' any packaging waste. This also allows the success of the strategy to be measured, as you will be able to see what has been saved through the implementation of the strategy.



7 Reviewing Success and Failure

Having implemented the strategy, the **next thing to do is to analyse** how successful it was.

Having decided on which areas to target, and what the intended outcomes were, these should be measurable if baseline results were recorded before the strategy was implemented. A review of the strategy should be able to show which projects worked well, and which did not. If goals were set beforehand, then the success of the overall strategy should also be measurable.





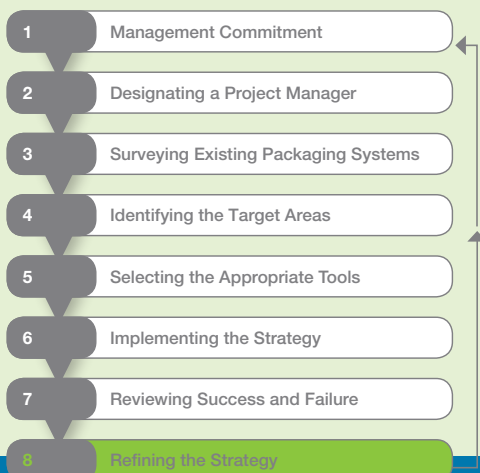
8 Refining the Strategy

Packaging Improvement is a continuous process. Technology is changing all the time and projects that did not seem feasible a short time ago are now becoming feasible.

For example, flexible film wrappers are being provided in thinner and thinner gauges while still retaining the required barrier properties, sealability and other functionality. Improvements in film manufacturing and packaging machinery technology now allow these film types to be used. There are similar improvements taking place with plastic bottle production, corrugated cardboard, glass, steel and many other packaging materials.

Within your own business circumstances could also be changing. For example, investment in particular machinery may become feasible where it was not before. Changes in the price of ingredients, materials, or product mixes could all have an effect on the packaging designs that will be employed in the future.

Having reviewed the Packaging Improvement Strategy and considered the changes to your business, a refined strategy can be considered that will improve your packaging even further. It is possible that you may require new tools from this booklet, or assistance from other areas, but it is certain that you will be able to make further improvements when you implement your initial Packaging Improvement Strategy.



Example: Packaging System Survey

A manufacturing company makes two products, one a 150g product in a 30g bottle and the second, a 300g product in a 50g bottle, and sells both in cases of 12 or 24 units. Each product is packed on a standard wooden pallet and stretch wrapped before despatch.

The required data and sales volumes are shown in the table below:

Product Name	Bottle Weight	Bottles per Case	Case Weight	Cases per Pallet	Pallet Weight	Stretch wrap Weight	Annual Volume (units)
150g product 12s	30g	12	150g	75	25kg	160g	20,000
150g product 24s	30g	24	200g	50	25kg	200g	10,000
300g product 12s	50g	12	250g	60	25kg	160g	15,000
300g product 24s	50g	24	300g	40	25kg	200g	7,500

Knowing the quantities and weights of each component allows the total packaging system weight to be calculated. In this example, one case of bottles is defined as the stock keeping unit and the packaging weights are calculated for each case. The proportion of the pallet weights and stretch wrap weights are also added to the total packaging weights for the case so that all of the primary, secondary and tertiary elements of the system are included:

Product Name	Total Bottle Weight	Case Weight	Pallet Weight	Stretch Wrap Weight	Packaging System Weight
150g product 12s	30g x 12	150g	25kg/75	160g/75	0.845kg
150g product 24s	30g x 24	200g	25kg/50	200g/50	1.424kg
300g product 12s	50g x 12	250g	25kg/60	160g/60	1.269kg
300g product 24s	50g x 24	300g	25kg/40	200g/40	2.130kg



Note also that a 'Packaging Ratio' can be derived for the amount of packaging used per product. These ratios are shown in the table below:

Product Name	Annual Volume	Product Weight	Total Product Weight	Packaging System Weight	Packaging Weight placed on Market	Packaging Ratio
150g product 12s	20,000	1.8kg	36,000kg	0.845kg	16,900kg	47%
150g product 24s	10,000	3.6kg	36,000kg	1.424kg	14,240kg	40%
300g product 12s	15,000	3.6kg	54,000kg	1.269kg	19,035kg	35%
300g product 24s	7,500	7.2kg	54,000kg	2.130kg	15,975kg	30%
Weighted Totals			180,000kg		66,150kg	37%

This is useful because it shows which packaging systems are most efficient. Looking at the 'Packaging System Weights' in isolation would suggest that the '300g bottle 24s' contributes the most amount of packaging. While this may be true, it is also the most efficient packaging system as it contains the least amount of packaging per weight of product (30kg of packaging per 100kg of product).

By considering the sales volumes, a weighted ratio can be obtained for all products. The above example gives a weighted packaging ratio of 37% for the four products considered.

So this example has calculated the total packaging system weight for each of the products sold by the company, and also shows which products have the most efficient packaging systems. It also allows an overall weighted packaging ratio calculated for the company's products. This means that benchmarks can be taken for individual products, or the company as a whole.

This section gives a brief outline of the tools that are available at the back of this booklet. They show how packaging can be reduced, re-used and recycled, and also consider primary, secondary and tertiary packaging.

Support Services

This tool points out some areas where external assistance and advice is available if required. It also contains links to web-sites that provide advice, training and testing facilities for packaging.

Packaging Policies and Packaging Specifications

This tool looks at packaging policies and specifications which can help you to decide how you want to manage your packaging, and control how packaging is delivered to you.

Packaging Design Brief

Before launching into different projects, it is worth considering the effects of the different choices you make with regard to packaging throughout the supply chain. This tool looks at some of these effects, and suggests using a packaging design brief in the form of a checklist to identify all the areas that may have an impact on your packaging.

Reducing Input Packaging

As well as asking your suppliers to optimise packaging, there are also ways of changing your own process methods to reduce the amount of packaging you receive. This tool examines some of these methods.

Reducing Output Packaging

This tool looks at various ways to reduce the amount of packaging you place on the market. As well as looking at primary packaging which the consumer takes home, it also looks at secondary and tertiary packaging which is less visible to the consumer.

Reusing Packaging

This tool looks at different ways of reusing packaging. Again, it considers what can be done with primary, secondary and tertiary packaging.

Designing for Recycling

As well as considering weight when designing packaging, the material used should also be considered. Some materials are more easily recycled than others, and this tool explains how to consider this at the start of the design process.



6 Further Assistance from Repak



For any future packaging changes **advice and assistance is available** through Repak's Membership Services department.

Information is also available on Packaging Advisory Services, Packaging Test Facilities and Pallet Optimisation software if any changes to packaging designs are being considered, or any further packaging optimisation opportunities found.

The Repak web-site contains examples of 'Best Practice' projects implemented by Repak members and information on the 'Essential Requirements' of the packaging legislation with regard to prevention and minimisation.

See www.repak.ie/preventandsave for further details.

The website also provides guidance on compliance with the packaging legislation, as well as ideas and suggestions on how to optimise packaging.



We hope you find the information on packaging in this booklet useful, as well as the tools and case studies that come with it. Further tools and case studies may be added in time and if you have any comments or recommendations with regard to this information please send them to info@repak.ie where we will be happy to take them on board.

Good luck with the toolkit and the implementation of your packaging improvement strategy!

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Support Services



Tool Description

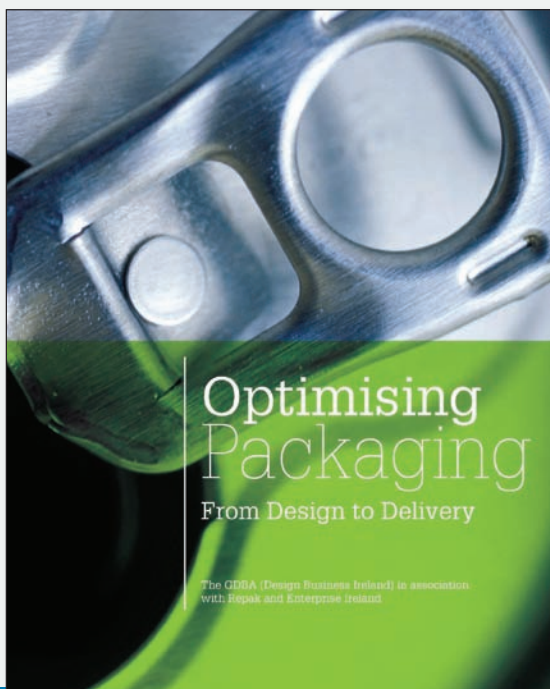
If particular experience or equipment is required when optimising packaging, it can often be contracted on a short-term basis from a number of support services. These services include packaging advice, training and package testing facilities.

Benefits of the Tool

- Expertise available for the duration of a project
- Training on specific aspects of packaging
- Specialist equipment accessible on a short-term basis

Possible Challenges

Project must be described accurately and parameters for testing specified correctly for the project to be successful.



Further Information

Advice:

The Repak Guide to Packaging Prevention:

www.repak.ie/preventandsave

The UK Waste Resources Action Programme (WRAP):

www.wrap.org.uk

Total Packaging Support at Smurfit Kappa:

www.smurfitkappa.ie

Training:

Packaging Training with the Irish Packaging Society:

Contact

David Little, Chairman
davidlittle@gmail.com

Testing:

Packaging and Transportation Testing at ANECTO:

www.anecto.com

Packaging Testing at Loughry College:

www.cafre.ac.uk

Packaging Testing Service



Description of the Service

Anecto is an ISO 17025 accredited test facility that provides world class support to product designers, developers and manufacturers.

Anecto's test centre employs the latest testing capability and equipment to achieve compliance to product and packaging standards such as:

ISTA, ASTM D4169-08, ISO (ISO 11607).

Benefits of the Service

Benefits of this service include:

- Compliance with international standards
- Elimination of unnecessary waste
- Appropriate packaging for need
- Security
- Reduction of cost
- Competitive advantage
- Compression
- Incline Testing
- Edge Crush
- Vibration
- Altitude

Testing available includes:

- Humidity and Temperature Cycling
- Drop and Mechanical Shock
- Climatic conditioning
- Tensile & Peel Testing
- Consulting Services

Possible Issues

The objectives of the testing must be accurately described to Anecto so that they can prescribe the appropriate tests.



Anecto's Compression testing equipment

Further Information

Anecto's Package and Transportation Testing Service:

www.anecto.com

Tel: +353 (0)91 757404

Email: info@anecto.com



Packaging Audit



Description of the Service

Smurfit Kappa Ireland offer customers a consultancy service called the Packaging Audit. Packaging accrues costs as it moves through the supply chain, from incoming raw materials to finished goods transportation and storage, through to final packaging disposal. The sum of all these costs is the 'Total Cost of Packaging'. A team of experts can be provided to help minimise this total cost, adding value for Smurfit Kappa's customers.

Benefits of the Service

The aim of the audit is to minimise the total cost of packaging for the customer. The following costs are examined during an audit:

- Incoming materials – price per box
- Incoming logistics – cost per truck unloaded
- Raw material storage – cost per pallet
- Manufacturing – cost per unit to assemble, fill and seal packaging
- Outgoing logistics – cost per pallet of FG storage & transportation
- Waste disposal – cost of disposing of incoming packaging waste
- Regulatory – cost of complying with EU legislation



Possible Issues

Packaging audits are most successful when all relevant stakeholders are involved. Typically this would include the Packaging Engineer, Purchasing Manager, Operations Manager and Marketing Manager.

Further Information

For further information please contact:

Joe Kennedy,
Design Manager. Phone: 01 4090000
Email: info@smurfitkappa.ie

Smurfit Kappa's Packaging Audit Service:

www.smurfitkappa.ie





Packaging Policies and Specifications

Description of the Tool

By examining your packaging you can decide what is important for you in terms of weight and volume of packaging, recyclability and recycled content. Priorities may include:

- Preventing or minimising packaging waste where it occurs.
- Working with suppliers to implement reusable packaging systems.
- Recycling back-door packaging waste at all of your premises.

Benefits of the Tool

Developing a Packaging Policy communicates your packaging priorities to staff, suppliers and customers. Developing Packaging Specifications allows you to implement this policy with your suppliers to deliver product and packaging that fits your chosen priorities.

Possible Challenges

Sometimes conflicts arise when deciding priorities. Using a lightweight, but difficult to recycle plastic for example.

Further Information

Contact Repak for further advice on Packaging Policies and Specifications:

colm.munnelly@repak.ie
or
john.coleman@repak.ie

Company X Preferred Packaging Specification										
<p>This specification outlines the requirements for packaged product deliveries to 'Company X', in line with its Packaging Policy. While some details are preferred, as opposed to required, any variations must be agreed and signed by both the supplier and the 'Company X' account manager before delivery of product to 'Company X'. This specification forms part of the supply contract.</p> <p>Legislative and Standardisation Requirements: Any company supplying packaged product to 'Company X' must comply with the following legislative requirements:</p> <ul style="list-style-type: none">• Leg001 Directive 2004/12/EC of 11 February 2004 on Packaging and Packaging Waste, and its amendments.• Leg002 S.I. No. 798, The Waste Management (Packaging) Regulations 2007, and any future amendments.<ul style="list-style-type: none">- including the Essential Requirements of Packaging (Part VI) of the regulations, and- including additional obligations on major producers (Part III), if relevant, through self-compliance or membership of an Approved Body (i.e. Repak). <p>Consideration should also be given to the following standards:</p> <ul style="list-style-type: none">• Sd001 EN ISO 9001:2000 Quality Management System Standard, and its amendments.• Sd002 BRC:GPH Global Standard 2004 on Food Packaging & Other Packaging Materials, and its amendments. <p>Waste Management System Any company supplying packaged product to 'Company X' must review their packaging for the following:</p> <ul style="list-style-type: none">• Rec001 Ensure design of packaging system has been optimized (Primary, secondary and tertiary).• Rec002 Ensure packaging weight has been minimized.• Rec003 Ensure packaging materials have been simplified (e.g. avoid composite material where possible).• Rec004 Ensure pallet volume has been maximized.• Rec001 Use returnable secondary and tertiary containers where possible.• Rec002 Use 4 way entry GKN Blue Chip pallets (1000mm x 1200mm) where possible.• Rec001 Ensure all packaging can be recycled in the market in which it has been sold.• Rec002 Consider the use of recycled material in the packaging, where possible.• Rec003 Consider the use of sustainable resources for packaging materials, where possible (e.g. pulp in paper, cardboard and wood).• Rec004 Where space allows, a plastic identification code should be used on all plastic packaging, aiding its separation and recycling. <p>Additional Requirements</p> <ul style="list-style-type: none">• Ad001 Each pallet should not have overhang and loaded pallet height should not exceed 1670 mm.• Ad002 The net weight of each loaded pallet should not exceed 1000kg.• Ad003 Stretch or shrink wrapping, slipsheets and pallet top protection should only be used if absolutely necessary.• Ad004 Merchandised display packaging must be removed from the store by the merchandiser. <p>Address Information This specification should be signed and returned by all 'Company X' suppliers to the following address:</p> <table border="0"><tr><td>'Company X'</td><td>e-mail:</td><td>xxx@companyx.ie</td></tr><tr><td>Address Line 1</td><td>fax:</td><td>01 xxx xxxx</td></tr><tr><td>Address Line 2</td><td>telephone:</td><td>01 xxx xxxx</td></tr></table> <p>Signed for 'Company X': _____ Signed for Supplier: _____</p> <p>TH DA</p>		'Company X'	e-mail:	xxx@companyx.ie	Address Line 1	fax:	01 xxx xxxx	Address Line 2	telephone:	01 xxx xxxx
'Company X'	e-mail:	xxx@companyx.ie								
Address Line 1	fax:	01 xxx xxxx								
Address Line 2	telephone:	01 xxx xxxx								

'Company X' Packaging Policy.

Packaging is an essential part of the supply chain. It contains, protects and preserves products; provides an efficient means of handling and delivering product; conveys essential information and presents the product for sale. Good packaging design ensures that all of these packaging functions can be carried out with minimum negative impact on the environment.

While 'Company X' recognises the importance of packaging, we do not want our packaging to have an adverse impact on the environment. We strive to use the minimum required amount of packaging, made from appropriate materials, and with a maximum possible recycled content. This is achieved through the principles of the Waste Management Hierarchy by:

- Preventing or minimising packaging waste where it occurs.
- Working with suppliers to implement reusable packaging systems.
- Recycling back-door packaging waste at all of our premises.

By using a 'Preferred Packaging Specification' we encourage our suppliers to:

- Optimise packaging through superior packaging design.
- Choose packaging materials that are locally recyclable.
- Select materials with a high recycled content.
- Choose sustainable sources for packaging materials.

'Company X's' packaging complies with applicable Irish Legislation (The Waste Management (Packaging) Regulations, 2007), the Essential Requirements contained therein and EU Legislation (Directive 2004/12/EC on Packaging and Packaging Waste), and their amendments.

Signature: _____

Date: _____

Packaging Strategy and Specification Review



Project Implementation

The Glanbia Ingredients purchasing team in conjunction with the environment team identified opportunities to reduce packaging costs through a Packaging Materials Specification Review. The resulting projects were implemented with current and alternative vendors. The challenge with this strategy was to reduce and minimise the amount of packaging while maintaining pack functionality and integrity.

Benefits of the Project

Some of the benefits resulting from this strategy were:

- Reduced weight and usage of pallet sheets, hoods and stretchwrap
- Re-designed paper sacks with less materials and simpler materials
- Increased use of returnable pallets
- Unnecessary plastic wrapping removed from incoming packaging
- In general, the Packaging Strategy led to annual cost reductions, reduced waste and reduced storage.



Issues Encountered

All actions initially had to be agreed with the relevant stakeholders before progressing further. Co-operation from Glanbia Ingredient's vendors was required to certify pack integrity before progressing to plant trials. Subsequent trialling was carried out in accordance with an established formal trial process.

Further Information

More information can be found at:

<https://www.glanbianutritionals.com/>



Packaging Design Brief



Description of the Tool

When starting on the design process for packaging of a new product, or even for an update to an existing layout, it is always useful to follow the guidance of a checklist to ensure the most important issues are considered. Such a checklist can result in large cost savings where matters may otherwise have been overlooked. For example, a change to an existing outer die-cut design might allow for an opportunity to reduce the board grade at the same time. If implemented on a fast moving product this could result in huge savings for your company

Benefits of the Tool

Using a checklist (See example overleaf) to improve the design of packaging allows:

- Convenient overview of total packaging system and how different elements relate to each other
- Savings in procurement costs due to tighter specifications on packaging
- Reduced liabilities to producer responsibility fees
- Less storage space required on-site
- Reduced transportation costs with Finished Goods
- Less chance of overlooking important elements of design

Possible challenges

Packaging design is often based on what is been used before for a similar product. It is important to have an opportunity to develop the packaging system in a holistic manner.

Further Information

For further information please contact:

www.repak.ie

www.wrap.org.uk



Packaging Design Checklist



Product Name:	Product Declared Weight:	Market:
<i>Guidance</i>		<i>Complete?</i>
		<i>Notes</i>
Primary Packaging:		
Barrier properties:	<ul style="list-style-type: none"> Suitability? Recyclable? 	<input type="checkbox"/>
Material Type:	<ul style="list-style-type: none"> Easily recyclable for end-user? 	<input type="checkbox"/>
Composite/Non composite:	<ul style="list-style-type: none"> Avoid composites where possible. 	<input type="checkbox"/>
Material Dimensions:	<ul style="list-style-type: none"> Minimum dimensions? 	<input type="checkbox"/>
Material thickness:	<ul style="list-style-type: none"> Minimum thickness? Affect on product? 	<input type="checkbox"/>
Formed on-site / bought-in?	<ul style="list-style-type: none"> Can packaging be formed on-site? 	<input type="checkbox"/>
Colour:	<ul style="list-style-type: none"> Affect on recyclability? 	<input type="checkbox"/>
Closure:	<ul style="list-style-type: none"> Same material as main pack? Easy Open? Tamper proof? 	<input type="checkbox"/>
Label:	<ul style="list-style-type: none"> Same material as main pack? Easily removed? 	<input type="checkbox"/>
Print:	<ul style="list-style-type: none"> Are printer ink containers returned to suppliers? 	<input type="checkbox"/>
Primary Packaging Weight:	<ul style="list-style-type: none"> Minimum weight? 	<input type="checkbox"/>
Shelf facing:	<ul style="list-style-type: none"> Optimum configuration? Agreed with Sales? Marketing? 	<input type="checkbox"/>
Secondary Packaging:		
Packing configuration:	<ul style="list-style-type: none"> Most efficient packing configuration? 	<input type="checkbox"/>
Pack Quantity:	<ul style="list-style-type: none"> Optimum pack quantity? 	<input type="checkbox"/>
Material Thickness, Grade:	<ul style="list-style-type: none"> Most suitable grade of material? 	<input type="checkbox"/>
Pack Dimensions:	<ul style="list-style-type: none"> Minimum size? Minimum headspace? 	<input type="checkbox"/>
Pack Weight, Type:	<ul style="list-style-type: none"> Suitable protection for primary packs? 	<input type="checkbox"/>
Shelf -Ready packaging:	<ul style="list-style-type: none"> Required? Best design? 	<input type="checkbox"/>
Material types:	<ul style="list-style-type: none"> Suitability? Minimum weight? 	<input type="checkbox"/>
Donnage Material:	<ul style="list-style-type: none"> Required? Recyclable? 	<input type="checkbox"/>
Tertiary Packaging:		
Pallet Type:	<ul style="list-style-type: none"> Appropriate for secondary packaging? Appropriate for transport container? 	<input type="checkbox"/>
Pallet Material:	<ul style="list-style-type: none"> Durability? 	<input type="checkbox"/>
Pallet Stacking pattern:	<ul style="list-style-type: none"> Optimum pattern for: <ul style="list-style-type: none"> - pallet height - container headspace - Health & Safety limits? 	<input type="checkbox"/>
Layer sheets:	<ul style="list-style-type: none"> Required? Material type? Reusable? Cardboard from other process? 	<input type="checkbox"/>
Corner Posts:	<ul style="list-style-type: none"> Required? Affect on secondary packs? 	<input type="checkbox"/>
Banding:	<ul style="list-style-type: none"> Suitable? Metal or plastic? Recyclable? 	<input type="checkbox"/>
Stretchwrap/Shrinkwrap:	<ul style="list-style-type: none"> Minimum gauge? Efficient wrapping? 	<input type="checkbox"/>
Reel cores:	<ul style="list-style-type: none"> Returnable? 	<input type="checkbox"/>
Stretchwrapper settings:	<ul style="list-style-type: none"> Equipment maintained? Settings optimised? 	<input type="checkbox"/>
Container size:	<ul style="list-style-type: none"> Optimum size? Transport conditions? 	<input type="checkbox"/>
Storage Facility:	<ul style="list-style-type: none"> Racks suitable size for pallets? Suitable for product journey? 	<input type="checkbox"/>
General:		
Legislation:	<ul style="list-style-type: none"> Essential requirements? Hazardous substances? 	<input type="checkbox"/>



Reduced Input Packaging



Description of the Tool

Purchasing ready-formed packaging can require large amounts of transport and storage space, both of which are costly. It can also require a lot of input packaging. Installing forming equipment on-site such as Blow-Moulding and Form, Fill & Seal (FFS) machinery manages to overcome these issues.

Benefits of the Tool

Forming packaging on-site allows you to:

- Reduce packaging associated with incoming deliveries
- Reduce the transit costs associated with shipping
- Reduce the unit cost of packaging
- Increase storage space available on-site
- Offer a quicker turnaround time to meet production requirements

Possible challenges

The design and installation of the forming equipment can be quite costly. However, this is usually overcome by a planned payback period between 1 – 5 years, depending on volumes and the complexity involved.

Further Information

More information can be provided by packaging machinery suppliers and packaging material converters and manufacturers.

Also, see overleaf for an example of where forming equipment has been introduced to a Repak member company.



Investment in Form, Fill and Seal (FFS) Equipment



Project Implementation

Glenisk invested in 'form fill and seal (FFS)' machinery to produce small yogurt pots on-site at their factory in Co. Offaly. This allowed for the removal of a large amount of input packaging from pre-formed pots. Instead, the pot material is now delivered in reels.

Benefits of the Project

Approx 1,000 tonnes (33% of total) of all Glenisk yoghurts now produced on this line per annum.

- Glenisk estimate one delivery of plastic reels is equivalent to 7 deliveries of preformed pots
- Reduction in the unit cost of packaging
- Reduction in transportation and storage costs
- Less waste
- More control over production variables
- A quicker turnaround time to meet production requirements

Issues Encountered

This equipment cost more than €650,000 to install and Glenisk are forecasting a 5 year payback period. Glenisk are currently adapting the machinery to form PET and recycled PET pots instead of PS pots, as PET is seen as being a more recyclable material.

Further Information

For further information on this project please contact Mark Cleary in Glenisk.

Alternatively visit their website at www.glenisk.com.



Reduced Output Packaging



Description of the Tool

By eliminating or reducing the amount of packaging on a product, packaging waste is also reduced. Primary, Secondary and Tertiary packaging can all be examined for opportunities to reduce packaging waste. Considering all three types of packaging together for reduction opportunities allows the total packaging system to be 'optimised'.

Benefits of the Tool

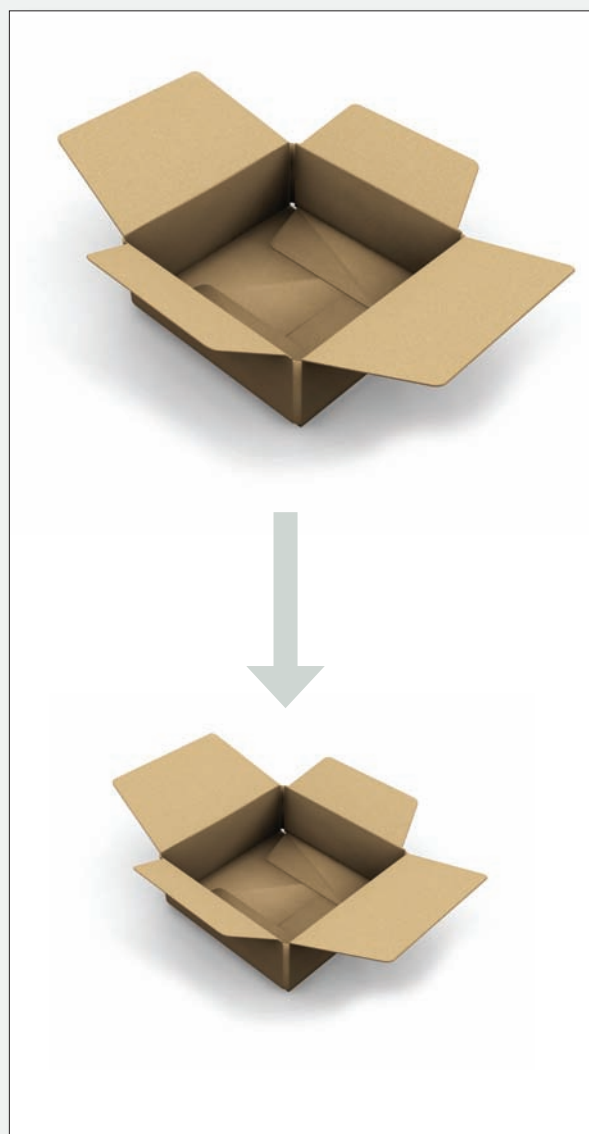
Reducing the amount of output packaging:

- Reduces the amount of packaging waste placed on the market
- Reduces the costs of packaging materials
- Reduces producer responsibility fees
- Increases the amount of storage space available
- Increases compliance with packaging waste legislation
- Increases goodwill from consumers

Possible Challenges

Knowing how much packaging material can be removed is the key to this tool. If too much packaging material is removed, or if the packaging is badly designed, the product it contains will become damaged. This defeats the purpose of the project as both product and packaging become waste.

Using experience and judgement as well as well-managed trials can help when using this tool. The experience of packaging material and packaging machinery suppliers could also be used as well as other external companies as described in the 'Support Services' tool.



Further Information

For further information see the Repak prevention site: www.repak.ie/preventandsave



Downgauging/Lightweighting

Project Implementation

Batchelors have worked closely with their suppliers to optimise the packaging design of their tins. The lacquered 400g / 420g can for peas and pulses is now a two piece can construction which weighs 49.7g. The old style can was a three piece can which did not have a necked in base and did not stack easily on shelves. It was critical that the look and feel of the can was not altered.

Benefits of the Project

- Changeover equates to an annualised reduction of 19.95 metric tonnes of steel in 400g/420g peas and pulse products.
- Success of the project means a similar redesigning of bean cans is in progress. A similar weight reduction in the bean can would equate to an annualised saving of over 50 metric tonnes of steel.
- There is a 10% saving in cost compared to the 3 piece can, but this should be seen in the light of significant price increases for the can.
- Producer responsibility fees decreased.
- 3.39g reduction in weight per can.
- 8.26% weight reduction overall.



Issues Encountered

The changeover to the 2 – piece can required the development of a lacquer that was compatible with foods. Handling, filling, processing and transportation trials had to be carried out to ensure that the 2 – piece can performance was compatible with the 3 – piece can. One of the key issues was can performance during processing that required internal pressure testing to ensure that the new can performance was compatible with the 3 piece can.

Further Information

For further information on Batchelors and cans see:

www.batchelors.ie
www.mpma.org.uk



Case Study

Maximising Pallet Volume Efficiency



Project Implementation

Computer software is now available to help companies maximise the amount of product they can fit onto a pallet. The software can also help to maximise the amount of product placed in a case, or the amount of pallets in a truck. By inputting product weight, case dimensions, pallet type and pallet height, the best pallet solutions can be found. Cape Pack is one example of this type of software system.

Benefits of the Project

Using palletisation software:

- Assists with the design of primary, secondary and tertiary packaging
- Maximises case fills and pallet volumes
- Maximises pallet storage space
- Maximises truck fill space
- Reduces tertiary packaging
- Reduces transport costs

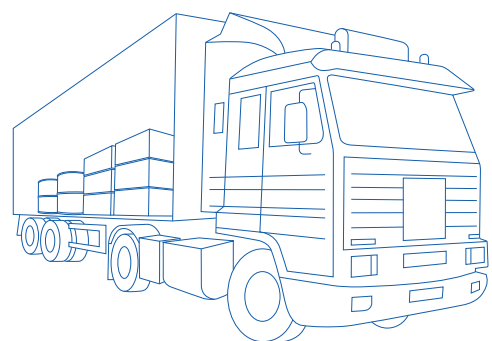
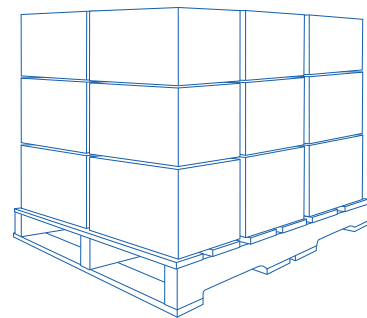
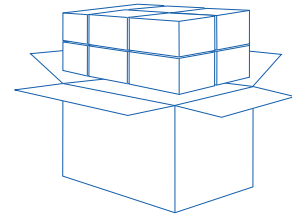
Issues Encountered

There are different versions of the software available depending on the complexity of packaging. **"Cape Pack Essentials"** is a simple entry level program, where Cape Pack has much more functionality. There is also a **"Truck Fill"** program available. Repak use the **"Cape Pack Essentials"** software and can produce examples or offer advice where required.

Further Information

For further information see:

<https://www.esko.com/en/products/cape-pack>



Reusable Packaging



Description of the Tool

Re-usable packaging is also an area that can help to reduce packaging waste. Again, there are opportunities to re-use primary, secondary and tertiary packaging. However, co-operation is required between the supplier and the customer to ensure that the re-usable packaging is returned, as it is often more expensive than single-trip packaging.

Benefits of the Tool

Reusing packaging with your supplier

- Reduces the need for you to purchase input packaging
- Reduces the amount of packaging waste produced on site
- Reduces waste management contractor fees

Reusing packaging with your customer:

- Reduces the need for you to purchase output packaging
- Reduces the amount of packaging waste placed on the market
- Reduces producer responsibility fees

Possible Challenges

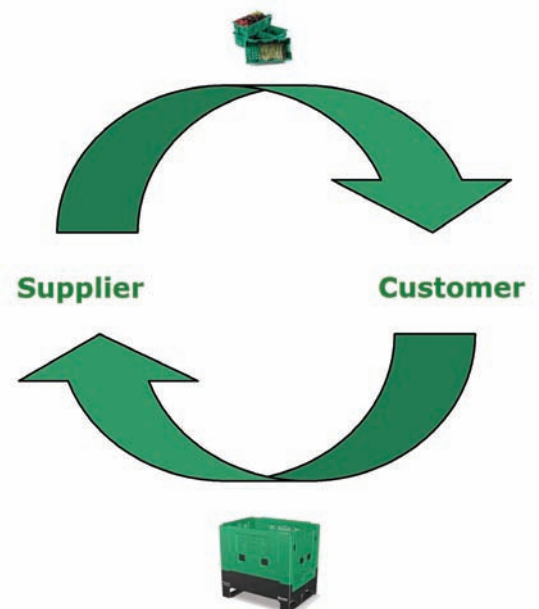
Reuse loops depend on being able to return packaging from customer to supplier in good condition. This requires that your supplier is close enough to ensure that it is economically viable to return packaging to them. Often, reusable packaging is collapsible or stackable so it can be returned in much higher ratios than it was delivered, i.e. one return journey for every 20 deliveries. This format also saves on storage space.

A number of trips must be undertaken to justify reuse packaging as it is often heavier than single trip packaging. Some packaging may require washing or cleaning before reuse, such as glass bottles, plastic totes or plastic pallets.

Further Information

For further information relating to reusable packaging please visit:

www.repak.ie/preventandsave



Reuse Bulk Containers



Project Implementation

Cadbury Ireland use various liquid ingredients in the manufacture of chocolate. These liquid ingredients arrive by means of Intermediate Bulk Containers (IBCs). Those sourced in Ireland are returned directly to the supplier whereas those sourced from the UK are used in an onward reuse system for transporting items like waste oils offsite to relevant facilities for treatment.



Benefits of the Project

Transporting materials using IBCs offers the following advantages:

- Higher volume of product shipped
- Less individual packaging, e.g plastic drums, bottles, etc.
- Easy to control batch sizes
- IBCs can be reused leading to less waste



Issues Encountered

There is a high unit cost associated with IBCs leading to a substantial investment required when implementing the changeover. A Cost/ Benefit analysis can help to illustrate the financial and environmental advantages of such a project.



Further Information

For further information relating to Cadbury's packaging initiatives please visit:

www.cadbury.com



Return Cases to Suppliers



Project Implementation

Green Isle source their pizza boxes from a company located in the Netherlands. These boxes get shipped to Naas in larger shipper cases. However, rather than discarding the shipper cases for recycling once they are no longer required, Green Isle send them back to the supplier on returning delivery vehicles.

Benefits of the Project

After implementing this project Green Isle experienced:

- Reduced producer responsibility fees
- More efficient waste practices within their plant
- Reduced amount of waste going for recycling
- Improved relationship with supplier

Issues Encountered

The carton supplier is based in the Netherlands, and so, an efficient and reliable transit loop was vital to the success of this initiative.

Further Information

For further information contact:

Padraig Broughall,
Environmental Manager, Green Isle Foods





Returnable Pallet Containers

Project Implementation

Many products, including packaging, are supplied in cardboard corrugate boxes. Sometimes it is possible to replace these boxes with a pallet sized container that can be collapsed and returned to the supplier for reuse. Typically up to 15 containers can be collapsed and stored on one pallet after being used.

Deliveries of thermoformed trays provide one example of this use for packaging as the trays still need a level of protection, but are normally delivered in quantities of several pallets. Firms such as Avoncourt Packaging use this type of returnable container to pack their products on request from their customers.

Benefits of the Project

Returning pallet containers to suppliers leads to:

- Reduced levels of cardboard for recycling
- Reduced amount of product unpacking
- Reduced producer responsibility fees



Issues Encountered

- Cost of return journeys must be negotiated.
- Volume of deliveries must be greater than a few pallets.
- Storage space is required for containers awaiting return.
- Empty containers must be well managed for return.
- Overseas suppliers may not wish containers to be returned.

Further Information

For further information on Avoncourt see:

www.avoncourt.com



Returnable Cages



Project Implementation

Instead of sending full cases of product to stores, Heaton's now send single units as they can identify unit sales at each store through their software system. Cardboard cases are stripped from product at Heaton's central distribution centre and product is shipped to stores in returnable steel cages.

The removal of cardboard cases also meant that tertiary packaging could be removed. The steel cages are on wheels and self secure, removing the need for pallets and stretchwrap. The cages are also collapsible, to save space.

Benefits of the Project

The benefits are based on the removal of packaging. They include:

- 70 Tonnes of cardboard removed from stores
- 2 Tonnes of stretchwrap no longer required
- 730 Tonnes of wooden pallets no longer being shipped to stores
- 1.5 Tonnes of cardboard redirected to packaging of 'on-line sales' items
- Reduced amount of in-store waste that needs to be processed

Issues Encountered

Staff needed effective training in order to recognise the advantages of this new system.

Further Information

For information on Heaton's see:
www.heatonsstores.com



heatons
expect more, pay less



Returnable Pallets



Project Implementation

CHEP is the global leader in pallet and container pooling services serving many of the world's largest companies. CHEP issues, collects, conditions and reissues more than 300 million pallets and containers from a global network of service centres, helping manufacturers and growers transport their products to distributors and retailers.

Benefits of the Project

Companies that use CHEP pallets as part of a recycling loop benefit from the following advantages:

- Less wood (Tertiary) packaging waste
- Less storage space required for pallets
- Damaged pallets are returned and fixed by CHEP
- Reduced producer responsibility fees due to reusable loop
- More control over wood packaging



Issues Encountered

Certain companies e.g. building services, etc. may struggle to have their customers return the pallets due to the nature of their business and the frequency of deliveries. Further analysis is required in these situations to confirm which is the most appropriate delivery system.

Further Information

For further information please visit:
www.chep.com

Or alternatively, contact:

Carmel Travers,
Commercial Manager, CHEP





Design for Recycling

Description of the Tool

Recycling has become more prominent with consumers over the past ten years. As a result, many people's purchasing decisions are influenced by how easy it is to recycle the associated packaging. In Ireland, glass, paper/ cardboard, steel, aluminium and wood are all recyclable. Certain plastics including LDPE, HDPE and PET can also be readily recycled.

Packaging made from one type of material (homogenous) helps the recycling process as it allows for easier collection and sorting. Packaging made from different or combined materials is more difficult to separate and process for recycling.

Benefits of the Tool

By designing for recycling companies may:

- **Make it easier for packaging to be processed for recycling**
- **Avoid introducing undesirable materials onto the market**
- **Reduce the amount of packaging waste going to landfill**
- **Reduce their Producer Responsibility fees**
- **Increase goodwill from consumers**
- **Increase compliance with the Packaging Waste legislation**

Possible Challenges

Lighter packaging versus easily recycled packaging. It is hard to have both.

Product requirements (e.g. chocolate bars require a high moisture barrier). Often a metallised layer is required on the plastic wrapper to preserve the life of the product.

Colours or process aids added to packaging materials. For plastics and glass, the clearer the material colour the better. However, some products require additional protection such as tinting, to protect against the effects of UV light. Here, colour must be added to the glass to protect the product.

Further Information

For further information please visit:

www.repak.ie
www.wrap.org.uk



Material Substitution and Reduction



Project Implementation

While redesigning their product range, an IT manufacturer took the opportunity to reduce the size of their standard product pack. At the same time, they removed all plastic so that the pack was made entirely from paper and cardboard, making it easier to recycle.

Further Information

For further information see 'Material Considerations' in the 'Guide to Evolving Packaging design' at: <http://www.wrap.org.uk/>

Benefits of the Project

- Pack made entirely from one material (paper/cardboard)
- Volume of the primary pack reduced
- Weight of the primary pack reduced
- Total packaging weight reduced
- Hundreds of tonnes of primary packaging material savings
- Over 400% increase in the number of units per pallet
- Pallet efficiency increased
- Less pallets used
- Storage space saved
- Tonnes of wood saved

Issues Encountered

Marketing and retail groups needed to be convinced of the benefits of the design change. Marketing needed assurances that sales would not be adversely affected by the reduced shelf space resulting from these changes.



REPAK
Business funding recycling

