

# PACKAGING MANAGEMENT

Surprising potential  
in terms of competitiveness  
and sustainability



In the automotive space, quality and efficiency are predominantly discussed in connection with large tasks like assembly, procurement, system development or delivery. By contrast, sufficient attention is still not paid to the topic of packaging management. Significant effects can be achieved in this area with relatively simple tools: optimising the workflow, reducing costs and implementing sustainable, environmentally-friendly work methods.



- 1 Management summary
- 2 What is packaging management?
- 3 Practical challenges
- 4 Project management
- 5 Sustainability
- 6 Results

## MANAGEMENT SUMMARY: The 4 pillars of successful packaging management

### 1. Reducing costs by optimising materials and processes

Manufacturers and suppliers who delve into this topic and are dedicated to it can often achieve cost savings of up to 80 per cent. This figure is no longer achievable in lots of other operational processes and it offers a huge return on investment. In absolute terms, the effects quickly add up to tens of thousands of euros per year for medium-sized companies and several hundred thousand euros for larger companies. Formel D is already achieving significant effects with material savings. In addition, we are reducing our usage of time and personnel resources in handling.

### 2. Higher quality throughout the value chain

The overall benefits of efficient packaging management go way beyond just cost savings, even for manufacturers, because all of the downstream processes, from warehousing to complaint management in aftersales benefit from the significantly higher quality. Thanks to better protection and therefore reduced return rates of vendor parts, packaging management ensures that the complaint rate goes down permanently and customer satisfaction goes up.

### 3. Improving sustainability by reducing waste

Due to new shortages and the increasing value placed on sustainability in the economy, the strategic importance of packaging management is becoming ever clearer. Material savings do not just save money but also reduce dependence on goods that are in short supply and permanently reduce usage of raw materials. Reducing waste, introducing circular economy elements and using materials sparingly means making an active contribution to protecting livelihoods and actively practising corporate social responsibility.

### 4. Expertise and independence get the results you want

Formel D supports manufacturers and suppliers with quality management throughout the entire value chain. We have an entire team of packaging engineers working here who work hard on optimising materials and processes. Independently of packaging manufacturers and service providers, they use their advisory skills entirely in the interests of their customers. The concepts apply to all companies and are transferable. They are developed in collaboration with scientific partners. With a team comprised of a total of 40 to 50 experts, the

company is one of the best-placed providers for the automotive space in this area.

### Summary: Stay competitive by introducing synergies throughout the value chain

Packaging management measures are well worth introducing when considering multiple company goals: reducing costs, increasing quality and improving customer satisfaction (and therefore also increasing customer loyalty and repeat purchase rates). All of these factors improve how you measure up in a competitive market.

There is no trade-off in packaging management. The positive effects even mutually improve each other and influence the entire value chain. Since the ROI is achieved very quickly, the results are excellent compared to the investments.

Thanks to the positive effects it has on the environment, packaging management is also an important element of corporate social responsibility and improves the company's image.

# PACKAGING MANAGEMENT AT FORMEL D

Packaging management is effective at the interface between the manufacturer's warehousing, the upstream parts suppliers and the downstream recipients. This affects all links in the supply chain, including supplies from tier 2 to tier 1. The most significant and complex interfaces are found at the OEM:

- + Inbound is the interface with the suppliers. Suppliers manufacture spare and engineering design parts, package them and deliver them to the manufacturer.
- + Outbound is the interface to the buyers. The OEM organisation is divided into
  - o series production, which uses vendor parts in the final assembly of the vehicles
  - o the aftersales market, where vendor parts are relevant as spare parts, primarily in retail and in garages.

Formel D is particularly active in OEM inbound. In this segment, the packaging managers need to create packaging for all parts (one car consists of 12,000 different parts on average); they also need to optimise it and, if necessary, redesign it or change the design altogether.

Packaging plays a role in protection, storage, transport, streamlining and communication. We generally also talk about packaging as having 5 functions. Whilst in the B2B logistics space, the sales function and appealing design does not play a huge role, packaging managers primarily focus on protecting the goods and preserving their quality, taking particular care when it comes to handling, including storage and stacking. Therefore, streamlining packaging is frequently a key focus. In the B2B space, the visual aspect is less significant. By contrast, both of the other criteria are even more important, though.

The goal of packaging management is for all parts to arrive undamaged, to be stored safely and in a space-saving manner and to be picked efficiently. An OEM warehouse keeps an average of around 400,000 different spare parts in stock. The majority of them are supplied in relatively small batches and 80 to 90 per cent of the processing is done manually.

**Whereas in outbound, primarily in series production, around 90 per cent reusable packaging is in circulation, the proportion is the other way around in inbound: single-use packaging accounts for around 90 per cent here.**

## PRACTICAL CHALLENGES

### Optimisation measures involve materials and processes

In automobile production, a significant proportion of the parts are procured and supplied from third parties. The standard goods delivery process in inbound goes from the supplier to the warehouse, where a packaging service provider works. Depending on what is agreed, there are three possible scenarios:

- + The supplier delivers the goods in the requested packaging, which are then stored straight away
- + The supplier delivers the goods loose and the goods are packaged by a packaging service provider
- + The supplier delivers the goods in packaging that is unsuitable for storage, and the goods are repackaged or supplemented at the incoming goods stage to prepare them for storage

The amount of required process steps increases the price markup on the goods as each handling step needs to be paid for individually. Formel D optimises these processes. The experts who work on site take a look at both the packaging and the processes. They

- + review the packaging of the supplied parts,
- + observe and analyse the process of packaging and repackaging
- + and evaluate the suitability of the packaging for storage.

The key challenges of packaging management are optimising the packaging and the packing processes.

- + The goal of optimising packaging is to be able to design it to be as simple, safe, cost-effective, lightweight and small as possible. It should

involve as little packaging effort as possible without being too highly specific and should be practical from a handling perspective. The rule of thumb is to use as little packaging as possible and as much as necessary. Packaging material is also continuously further developed to make it more environmentally friendly.

- + The goal of optimising packaging processes is to use as few process steps as possible. Each process step costs time and money, potentially requires additional materials and adds a potential source of error.

The Formel D packaging engineers work in three groups: Packaging planning, packaging development and packaging definition. With regard to the team's core services, we also talk about the 5 pillars:

- + Analysing and optimising the packaging process
- + Analysing and optimising the packaging materials
- + Assigning suitable existing packaging to vendor parts and developing new packaging
- + Drafting contracts between suppliers and manufacturers and monitoring the interface
- + Documenting and reporting to the client

The optimisation generally leads to a packaging agreement between the manufacturer and the supplier, which precisely specifies which packaging is used for which type of each vendor part. This guarantees that the quality level is maintained and ensures reliability in implementing the identified solution.

# THE 5 SUB-PROCESSES OF PACKAGING MANAGEMENT

Formel D has 25 years' experience in packaging management to look back on and helps suppliers and OEMs along the entire value chain optimise the type and quality of their packaging, protect goods, and simplify and accelerate processes. This minimises supply failures, protects the data pool, reduces the defect quota and optimises the use of existing space.

In practice, packaging management is comprised of a total of 5 sub-processes:



## Packaging planning

starts at the supplier stage and covers the logistics concept and coordination. Adjustments and instructions are issued, the quality and profitability of the packaging is optimised, hazardous goods are dealt with and safety data sheets are issued.



## Packaging definition

relates to the selection of the packaging itself and covers the storage process, either in inbound or in outbound. New and existing packaging is defined here, complaints are processed, the flow of goods is controlled, palletisation is optimised, additional deliveries are prioritised and packaging is tested.



## Packaging development

relates to developing new packaging and optimising existing packaging concepts in collaboration with suppliers and packaging service providers. The goal is to achieve safe and efficient management and movement of packaged goods along the internal process chain. Standards are defined and new packaging is tested and analysed.



## Consulting

is a support process from the supplier to the use of the parts in outbound and is concerned with managing and optimising existing logistics concepts, benchmarking, financial controlling and reporting.



## Research and development

identifies opportunities for innovation and implements innovative elements via project management with all individuals involved in the process, ensuring that a more efficient, effective and sustainable solution is implemented transparently.



# THE 5 OPTIMISATION FORMULAS FOR PACKAGING MANAGEMENT

The optimisation formulas for packaging management are also known as the 5Rs. They include the following elements:



## **Remove**

We get rid of superfluous packaging. This often applies to repackaging, which is a historic relic and no longer has a clear function. Doing away with these elements is something that, based on the skilled professionals' work, can achieve particularly rapid and valuable results.



## **Reduce**

Existing packaging is used more sparingly in terms of materials, for example by using thinner foils or more basic paper. Alternative packaging options are also used.



## **Redesign**

The packaging design can be adapted. One example of this is an automatic cardboard base that collapses on its own, thus streamlining the handling process. Taking automatic or semi-automatic processes into consideration in packing and unpacking plays an increasingly significant role and packaging is adapted accordingly.



## **Redefine**

After analysing order status trends, it may be useful to adjust the batch sizes. This means that packaging sizes can be adapted to the actual quantities that are typically required. Even packaging two brake disks instead of just one in a box achieves measurable effects. Using bags instead of cardboard can be more efficient, especially for durable parts.



## **Reinnovate**

This relates to new materials and cycles that can ever more frequently be optimised for reusability and recyclability, including in the automobile sector. Circular economy elements not only reduce costs but also make an important contribution to sustainability.

A typical Formel D work team arrives on site with a small group of experts who monitor the specific processes and optimise them instead of carrying out the processes themselves. In particular, in the packaging planning and development field, this includes engineers who define the packaging and skilled professionals in the field of warehouse logistics.

They generally have a background with very broad experience and knowledge of thousands of types of packaging, unlike suppliers who are often only able to dedicate very little attention to this topic and have much less experience with it. The skilled professionals exchange their ideas in an interdisciplinary approach. They understand which solutions work and everyone

benefits from the team's varied experience and perspectives depending on the existing processes in the incoming goods warehouses at various OEMs.



## PROJECT MANAGEMENT

The Formel D teams at vehicle manufacturers currently primarily work in inbound, i.e. at the interface between suppliers and the warehouse. The headcount is comparably low: in incoming goods and in the warehouse, the additional use of Formel D packaging experts often only makes up one to two per cent of the team; storage-appropriate repackaging is often handled by additional external service providers. At the same time, the Formel D teams work on in shifts to provide full monitoring of the delivery process with regard to packaging management.

### Incoming goods monitoring and goods handling

As a first step, the teams check whether parts are arriving packaged as agreed and undamaged. If this is the case, they can be stored straight away. If this is not the case, the goods are assessed, inspected for transport damage and repackaged into suitable packaging. The suppliers must bear the costs for this and, depending on the agreement, may have to pay a contractual penalty as they are obliged to coordinate packaging concepts with the responsible packaging planner before the first delivery of the parts to the warehouse; they are also required to comply with any packaging agreements that have already been concluded.

2 to 3 per cent of the goods being delivered are new goods. There is no internal or external packaging specification for these deliveries; they arrive at the warehouse in packaging that was selected by the supplier. These parts are then passed straight on to the Formel D team where they undergo a specification process. For the analysis, the experts, who are employees with industry experience in the commercial or logistics space, create solutions using their experience and a large number of existing packaging options. Where existing solutions will not create a satisfactory result, new packaging is designed and incorporated into the contractual negotiations with the supplier.

Since the role of project manager is relevant at the start of the incoming goods process, they also make decisions on subsequent costs in the process. Repacking, storage and order picking are only as efficient as the packaging. Accordingly, monitoring and supervision directly at the delivery stage makes the entire chain of downstream activities more cost-effective.

The quality of the parts themselves does not form part of the analysis. Formel D carries this part out at its own Quality Control Centres (QCCs), which are staffed by far more project employees. Packaging management can be directly upstream of a QCC. In this case, Formel D handles both steps in the value chain sequentially.

### Damages and complaints

Since the objective of packaging is ultimately to keep the goods undamaged, packaging management is an important aspect when it comes to preventing complaints. On the one hand, complaints arise at OEMs from production and, on the other hand, from buyers in the aftersales business, i.e. generally from wholesalers of spare parts. Reducing the complaint rate is an operational goal for lots of manufacturers and not only serves to reduce logistical and financial expenses but also maintains the company's image as a quality provider.

The largest risk imaginable is that some of the goods do not even arrive at the warehouse due to insufficient packaging. It is essential to prevent this from happening as it can lead to serious bottlenecks. In addition, there are multiple potential scenarios in which goods may be damaged:

- + In incoming goods, damages are often incurred at the transportation and supplier stages. Transport damage is covered by the freight company. It is important to identify the role that packaging plays here. If entire batches arrive damaged, it may be necessary to redesign the packaging.
- + Damage occurs wherever humans are involved, even just because of careless handling. This is the main risk on the journey the goods take from incoming goods to warehousing and then to outbound. Good packaging should ensure that such damages are reduced to a minimum.

The OEMs generally issue guidelines specifying which type of damage is tolerable and to which extent. Outbound is central to this. In the event of a complaint, a subsequent delivery is necessary, and the repair process is delayed. Two defective deliveries can significantly increase the reputational damage.

The more discerning the end customers, the stricter the requirements; specifications for maximum complaint rates can even go down from 3 to 4 per cent to under 1 per cent with high-end providers.

Formel D's work is designed to guarantee quality under these fundamental principles, ensuring that it achieves an optimal level for the client, taking into account scheduling and financial demands.



## SUSTAINABILITY

There are multiple aspects to sustainability, with climate protection and environmental protection being the most well known. As well as the environmental concern, financial and operational sustainability is very significant and potentially even more significant. The aim is the same in packaging management: Every action that saves materials promotes sustainability in all of these areas. Therefore, the financial and environmental goals do not contradict each other here. The same applies to evaluating the process because ineffective processes also always come at the cost of other resources and impact the environment as well as the budget due to transport and repackaging.

Whilst financial sustainability can be intuitively achieved by means of long-term cost reductions, it is worth taking a closer look at operational sustainability. This is because, unlike in the past, almost all packaging materials are affected by shortages. Wood, paper and cardboard are increasingly becoming bottleneck materials; avoiding using these materials therefore also contributes to protecting the process flows. The goal is to replace virgin fibre materials with recycled options. New materials from alternative raw materials are also being tested. At least in the front sales levels, there are also increasingly plans to introduce reusable packaging.

Formel D is proactive on this issue in the interests of its customers and works on new solutions years before the acute need for sustainable alternatives threatens to restrict market players' scope for business activities.

### Materials: Less is more, different is better

Even just saving materials by getting rid of superfluous packaging and using packaging that utilises materials efficiently (remove and reduce) leads to an average raw material usage reduction of 20 per cent. Due to the high proportion of single-use packaging used in inbound, the effect is similar when it comes to waste reduction.

When redesigning packaging, Formel D places great value on reducing the amount of plastics being used. New packaging is not designed using plastic and the plastic part contained in existing packaging is constantly being reduced. The goal is to exclusively use biodegradable materials.

For years, Formel D has been working together with partners from science and research to develop entirely new materials (reinnovate). The goal here is to turn treeless pulp made from regional resources into the new standard and thus make using paper and cardboard unnecessary. This reduces transport distances and protects global tree populations.

Whilst grass provides a good base for filler material, the required strength of the shell is created by using fibre-rich plants like hemp, reeds, bamboo or elephant grass.

### Process: An intelligent workflow reduces the use of resources impacting the environment

When a process champions the concept of sustainability before the user, it does not just protect the environment but also looks after the user. This becomes clear during the end-to-end review of packaging, also known as one piece flow. The goal here is to use packaging from the first to the last sales stage without it being changed, processed or contaminated.

The goal behind this is not just to optimise the process but also to protect recyclability. There are already established and efficient processes in place for recycling paper and cardboard that produce very sustainable results, provided the material stays 100 per cent clean. The first requirement for this is mono-materials, which can be disposed of in one piece. We need to avoid using mixed packaging that requires laborious separation procedures before recycling as well as processes where the material is contaminated with plastic adhesive tape or foils. Therefore, Formel D avoids using plastic pockets for delivery notes.

A consistent process can be created for spare parts with the right packaging, which does not require any further labelling or repackaging right up to the wholesaler. As such, any actions that impair recyclability are stopped. It is not necessary to consider the visual elements and make the goods look appealing until they reach the private end consumer; the packaging is then recycled there. Ideally, this process is defined in a packaging agreement.

Another way to achieve sustainability is through increased automation, because lots of manual processes lead to improper handling of the packaging, e.g. due to incorrect separation or failure to separate the materials. There are lots of examples: from counting and weighing to straightening cardboard as well as sealing and stamping. Even semi-automatic process steps lead to better results. The Formel D engineers continuously analyse existing processes for automation potential.

## RESULTS

The priority of the topic of packaging management looks different for different OEMs. Whilst some develop efficient measures themselves in this area, others have not yet properly considered the topic because it is seen as a small, niche field without great potential. Accordingly, the topic is addressed in a very unspecific way or just handled internally in some cases by employees who do not always have sufficient qualifications in this area. In other cases, the issue is outsourced to a packaging manufacturer or service provider. This tends to make manufacturers dependent on their service providers, because they do not provide independent advice.

Practical experience demonstrates that packaging management actually does have great potential in terms of quality improvement. In a market comparison, with 40 to 50 full-time roles, Formel D is a relatively large provider in this space. The experts who work for us are independent and the concepts are universal and transferable. At the same time, the experts can delve into country-specific regulations, like the special recycling rules that are currently being introduced in Italy or the 'Grüner Punkt' in Germany. Other countries may follow suit soon.

The financial benefit can be measured directly and indirectly. Some practical examples demonstrate impressive results:

- + The effects become visible very quickly from savings made on packaging expenses. Formel D carried out an overall evaluation of the existing range for a large OEM and prepared the packaging regulations: Even just the 'remove' activity, i.e. getting rid of superfluous packaging, led to an annual saving of around half a million euros, equal to 5 to 10 per cent of the total packaging costs.
- + In the same period, a cross-functional evaluation of product groups (e.g. brakes, bumpers, air conditioning systems) led to savings of over 400,000 euros for a different manufacturer.
- + Optimising incoming goods to achieve better direct warehousing by a very small project team led to savings of over 220,000 euros in the first year; in the second project year, this value increased to almost 340,000 euros.

In the value chain of automotive companies, packaging management may well be an area that has been truly side-lined, but it is an area that can achieve astounding results with comparably low costs. Work in other sectors has also created similar results, e.g. in veterinary medicine, wind power or solar energy. Here too, 80 per cent cost savings were more the rule than the exception.

The indirect effects cannot be linked to a specific figure, but they affect all the related value areas. For example, a regular review report carried out by our team makes it possible for the purchasing division to generate a complete picture of the suppliers' quality loyalty. This initiates further processes in claim management, via which repayments of suppliers can be initiated that would otherwise not have been noticed. We also support organisation of precisely written tenders that meet the requirements.

The benefit of using a Formel D team is daily shift work with experts on-site. They can gain a picture of incoming goods at the site. We mean this literally: As part of packaging management, the Formel D teams also carry out related activities like documenting delivery conditions and photographing parts. As astounding as it may sound, the parts are not necessarily fully documented everywhere and procurement does not always know what they look like. Since no particular specifications are given for the photos, even if they are used for the online catalogue, customers often do not use professional photographers. In some cases we have experienced, for example with complaints, the experts were able to communicate with the customer's screen employees because they wear camera glasses.

Such services are supplemented by master data maintenance and systematic measurement of the parts. Measurement machines are able to automatically identify master data using the measurements. This not only leads to significant time savings but improves data quality in general. Lead times are reduced accordingly, inventories are managed efficiently and superfluous orders are prevented. This aids the company's liquidity and ensures that the entire workflow can be controlled precisely.

Overall, packaging management is worthwhile for everyone involved in the automobile value chain. Particularly in medium-sized companies, it is not always expedient to have in-house experts. The expertise provided by Formel D accordingly leads to rapid and long-term cost savings, improved workflow, higher delivery quality and greater sustainability. Training is also offered by Formel D.

Sustainability and cost efficiency are closely related and go hand in hand. There is no need to worry about a conflict between these goals when it comes to implementing measures. Companies that have the overall process analysed and reorganised achieve the best results as the entire value chain profits from it. The image effects that can be achieved by protecting

natural resources, e.g. via CSR campaigns, should not be neglected.

Ultimately, introducing targeted packaging management puts an end to waste. Consequently, the ROI is also high and quick to achieve. It is even possible to discuss refinancing the optimisation service directly from the savings and thus reduce expenses as a whole.

Such commission-based models are particularly attractive to medium-sized companies. They create a classic win-win situation: Whilst noticeable improvements do not require investment from the supplier and therefore protect liquidity, the efficiency gain is divided up fairly. This means that Formel D can refinance the service from previously planned budgets. As a result of partially retaining the reduced expenses for suppliers, however, a not insignificant proportion of the effects remains directly noticeable. Therefore, this company improves its competitiveness and profits from it within a very short period.

# THE DRIVING FORCE.





Formel **D**