

TAMPERPROOF DULUX PAINT CONTAINERS

Organisation	RPC Containers Ltd
Trigger	<ul style="list-style-type: none"> ICI paints asked RPC if they could redesign their paint containers to prevent ICI's Dulux emulsion paint being removed and replaced with a cheap coloured water mixture.
Objectives	<ul style="list-style-type: none"> To provide a cost-effective product redesign of Dulux plastic emulsion paint containers to make them tamper evident.
Tools/techniques	<ul style="list-style-type: none"> Discussion with client about needs and the problem encountered with old container design. Brainstorming sessions within the RPC Product Development team to come up with ideas to solve problem.
Enablers	<ul style="list-style-type: none"> RPC both design and manufacture the containers, hence they understand the manufacturing implications of design modifications. Regular meetings held with client at which new ideas and any problems can be discussed.
Tensions	<ul style="list-style-type: none"> None
Impact	<ul style="list-style-type: none"> No further cases of tampering reported. Container lid redesigned with minimal changes to tooling and hence very low cost solution.
Lessons	<ul style="list-style-type: none"> Working closely with clients ensures problems dealt with quickly. Minor modifications to a product can solve potentially very damaging problems. An understanding of the manufacturing process by the design and development team helps cost-effective product redesign.

Synopsis

This case illustrates a product redesign to increase resistance to crime in the form of counterfeiting. The case analyses the redesign and manufacture of a plastic paint container lid. ICI began experiencing counterfeiting problems with products sold through a DIY chain operation in the Birmingham area. Containers were discovered which had been opened, the contents decanted off and replaced by coloured water. Technical and Development Manager Glyn Staines of RPC Containers Ltd was asked by ICI paints to redesign their paint containers to evidence any tampering. Staines and his team solved the problem by redesigning the lids such that the open screwdriver slots, designed to enable the container to be opened easily, were covered by a very thin plastic membrane. This maintained the easy opening facility but it was evident at a glance if the lid had been tampered with. The solution was also designed with manufacture in mind. Minimal changes were needed to the tooling, ensuring a very cheap solution to a potentially very damaging problem for the client. The redesigned product was in full production within two months of RPC being alerted to the problem.

Background to Tamperproof Dulux Paint Containers

RPC Containers Ltd based in Oakham, Leicestershire produces plastic containers for a variety of customers primarily in the food and paint industry and is a part of RPC Group plc. Since a management buyout in 1991, and subsequent stock floatation two years later, the company has grown dramatically. In 1991 the group had 5 factories and a turnover of £32M p.a. By 2000 this had grown to 32 factories across Europe, with a turnover of approximately £300M p.a. and employing some 4000 people.

The Oakham factory has been producing injection moulded plastic containers for 27 years and is a major supplier of these products to such household names as ICI, Nestle and Unilever. The major type of crime considered a problem by the packaging industry is that of tampering with the products contained in the packaging. This is a big issue for the food industry, with several well-publicised cases bringing the problem to the attention of both the packaging industry and the public. Thus tamper-evident packaging has become the norm for many foods from soups to coffee to margarine. RPC's major food customers therefore have required RPC to come up with tamper-evident packaging for many years. Sealed membranes and tear-off strips, as shown in Figure 1, are the most common solutions.



Figure 1: Photo of sealed membrane and tear-off strip solution for food packaging

Tampering was not however seen as a problem in paint distribution. As Staines explains:

“Tampering was not perceived as a problem by us or the paint manufacturers. Issues such as resistance to impact, a split paint container can make a lot of mess, and ease of opening were matters which concerned us” (Technical and Development Manager).

Then, ICI Paints encountered a problem with their Dulux emulsion paint containers, produced by RPC. Some 5 years ago, 15 years after the plastic paint containers

were introduced, a problem of counterfeiting emerged. In the Birmingham area, in a number of branches of a large DIY chain, it was discovered that the original Dulux product had been removed from the container and replaced with a cheap coloured water mixture. This was a serious problem for the brand leader, which if unchecked could potentially damage the Dulux high quality image. This case is based on an interview with Glyn Staines, Technical and Development Manager, RPC Containers.

Design Process

The brief

RPC had a very close relationship with ICI Paints and the two companies held regular meetings to discuss new ideas and problems which might arise. At one of these meetings, the tampering problem was brought up by ICI. RPC were not given a written brief but as Staines explains,

“They raised it as an issue, what can you do to provide evidence of tampering?”

RPC was asked to provide a cost-effective product redesign of their plastic emulsion paint containers to make them tamper evident.

Concept

After the initial meeting with ICI, Staines and his six strong development team brainstormed the problem. A member of the team suggested that if the open screwdriver slot, which allows easy entry into the container, (see Figure 2) were covered with a very thin plastic membrane, then it would be evident if someone had tried to open the tin just by looking at the lid.



Figure 2: Photo of old design of Dulux lid and container

Development

The initial drawings for the modification were sketched out by Staines and the details of this solution were then hammered out by the team. The team worked out that this could be achieved very cheaply and easily. The containers are produced by injection moulding, which requires high initial tooling costs. Any major modification of the

moulds had the potential to be expensive. However, the RPC team's understanding and experience of the process ensured a cost-effective solution. The thin membrane required to provide evidence of tampering required a little extra plastic to be moulded into the lid. This meant therefore that only a minor modification was required to the mould. A small amount of metal needed to be shaved off the lid-mould, to allow the extra plastic to flow in. A cheap, easy, ingenious solution to what could have been a very costly image-damaging episode for ICI. Figure 3 shows the redesigned lid before opening. Figure 4 shows the lid replaced after opening. Evidence of opening can be clearly seen.



Figure 3 (left) Redesigned lid showing new 'closed' slot design, before opening and Figure 4 (right) Redesigned lid after opening showing evidence of tampering

If the counterfeiter attempts to open the lid anywhere else around the rim in an attempt to circumvent the new membrane, then the rim is damaged and again this is obvious to the eye. The whole redesign process from the raising of the problem to the redesigned containers being in full production took only two months.

Impact

It is five years since this design modification was made and no further incidences of counterfeiting have been reported.

Lessons Learned

This case shows that the design of a product to reduce crime need not always be expensive. Having a close working relationship with customers and holding regular meetings ensured that the problem was dealt with quickly. The solution was highly cost-effective and very speedily brought into full production as a result of an intimate knowledge of the production process by the product team.

References, Related Case Studies and Further Reading

Design Policy Partnership (2001) *Off the Shelf*. Sheffield Hallam University and the University of Salford.

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Classification Index

Ekblom's crime classification	Mishandling (Counterfeiting)
BCS crime classification	Fraud & forgery
DAC	Protecting profits
Primary motivation	Product protection
Type of designer	Industrial
Approach	Problem-solving
Sector	Retail
Location	Shops
Author	Anne Tomes

DAC Dulux