

Mike Rice (Bobst) presents Alan Smith (Kingston Carton Company) with their Bobst Green certificate.



FOOD GRADE FIRST FOR KINGSTON

With concern increasing about the mineral oil contamination of food products by packaging, the Kingston Carton Company is the first UK cartonmaker to implement mineral oil free manufacturing using Bobst's food-grade lubricant transformation programme.

It wasn't the cost of replacing the clients' packaging that worried Kingston Carton Company. "It was the cost of replacing the food that goes in it," says Arend Buitendam, Managing Director of The Kingston Carton Company, explaining why the company has implemented a Bobst programme to migrate its conversion equipment from lubricants based on mineral oils to solely food grade synthetic lubricants.

Ensuring the production of hygienic packaging is a must for all producers of food packaging whether there is direct or indirect contact. However, all packaging production machines, from printing presses to folder-glueers, occasionally shed lubricants from moving parts onto the packaging they are producing. While manufacturers aim to spot and remove any affected product, there is always the possibility that contaminated packs will reach the clients' packing lines.

This then makes it possible for dangerous chemicals to migrate from the packaging into the food itself. Converting to the use of food-grade lubricants in packaging production equipment removes this risk, says Mr Buitendam. "If you look at the investment needed to convert your equipment, compared to the potential cost of a claim from a brand owner for mineral oil contamination, it pales into insignificance. A single job that earns you a few hundred pounds in profit might potentially cost you hundreds of thousands in claims."

On top of such worries, Mr Buitendam says that there is also the risk of damage to

a company's reputation. "You could lose all sorts of business because of something like that — and it could have an effect on more than just profits. We're privately owned, but for a listed company it could decimate their share price, which could have all sorts of implications."

UK First

Kingston Carton is the first UK carton manufacturer to take advantage of the Bobst programme and has migrated two Visioncut die-cutters, which handle all its food packaging, as well as its entire folder-gluer department, to food-grade lubricants. Production Manager Alan Smith says that migrating this equipment has been on his wish list for over two years. "We first risk assessed the areas where mineral oil contamination of our customers' cartons might be an issue. Clearly print was the most vulnerable area so, when we bought our Roland 700 direct drive litho press, we had it supplied with a food grade lubrication system so now all our printing presses run with food grade synthetic oils. Then we started looking at other areas of risk. Our analysis showed that conversion, in particular die-cutting, was the next process we needed to look at. Once Bobst had a solution for that, we jumped at the chance of using it and we decided to migrate our folder-gluer at the same time."

What's the problem?

Any mineral oils present in packaging materials can contaminate food products if that food is not protected by a barrier layer. Derived from crude oil, mineral oils have been identified as a source of two different types of contaminants that have been found in food products, says Foodwatch, the European consumer rights organization. Mineral oil aromatic hydrocarbons (MOAH) are suspected of being carcinogenic and mutagenic, leading the European Food Safety Authority (EFSA) to rule that any exposure to aromatic hydrocarbons in food presents a potential risk. The other identified contaminant, mineral oil saturated



Mike Rice (Bobst) Paul Willer (Bobst) and Alan Smith (Kingston Cartons) inspect an oil sample.

hydrocarbons (MOSH), are known to accumulate in the body and can damage numerous organs.

Analysts working for Foodwatch identified that, when it comes to food products, one source of these dangerous hydrocarbons is mineral oil lubricants used in the packaging manufacturing process. Lubricants can be 'shed off' by equipment as a pack is processed or the pack might touch a greased or oiled element in the machine. The resulting residue on the packaging may come into direct contact with the food product, or can migrate through a 'clean' layer into the food. So, for example, mineral oils present in secondary packaging could pass through primary packaging to contaminate the food product.

While mineral oil contaminated packaging presents a threat to humans, the use of non-mineral oil based lubricants can seriously damage production equipment. This is why the Bobst programme to develop food-grade lubricants suitable for machines such as die-cutters and folder-gluer has taken a while — so says Mike Rice, Bobst's Regional Services Manager covering the UK, Ireland and Scandinavia. "Our research and development teams have spent thousands of hours testing different food grade lubricants to be sure that their use doesn't damage the machines they are put into. Oil has to be tested, not just in one type of machine, but in a whole range of

machines. It has to be as safe to use in an SP102E running at a few thousand sheets an hour as it is in an Expertcut that runs at 9,000. Likewise, we had to assess whether a particular food grade lubricant was suitable, say, for use on a set of die-cutter gripper bar chains. Does it have the right tack qualities as well as the right lubrication properties?"

Food-safe Range

The result of this research and development has been the launch by Bobst of a range of lubricants and cleaning products classified as grade H1 by NSF International, the globally-recognised independent accreditation body. The H1 grade is that suitable for incidental food contact and is a prerequisite for use in the food, pharmaceuticals and cosmetics industries. Fully synthetic, the range covers every type of lubricant needed to migrate a die-cutter or folder-gluer to safe alternatives and away from mineral lubricants, including gear and lubricating oils, spray lubricants, creep oils and greases.

Bobst NSF-H1 lubricants are based on synthetic oils containing a food grade poly alpha olephine (PAO) base-oil, augmented with high performing food grade additive packages, depending on the application. The specification of these lubricants is such that they ensure equal, or better, performance levels compared to the mineral

NSF-HA transformation



Oil cleaner at Kingston Carton

units continuously filter out contaminants such as water and particulates from the machine's main oil circuit, in most cases removing the need to carry out oil changes for years on end. "Oil never really wears out, the problem is the contaminants," explains Alan Smith. "So, twice a year we carried out oil changes on our die-cutters as part

oil based products they replace. And, along with ensuring the safety of the consumer, Mike Rice says that the development of the range also reflects the continuing Bobst focus on fault-free packaging. "Ensuring that their cartons cannot be contaminated by mineral oils removes the risk to the cartonmaker of having a consignment rejected. It's another one of our Bobst developments designed to help our customers work towards 'zero fault' packaging."

Bobst now offers a complete migration programme which converts customers' equipment from mineral oil based lubricants to Bobst NSF-H1 food grade products. The process involves an initial audit of the lubrication on the machine and a laboratory analysis of its oils. "We do this to ensure that there are no unseen problems within the machine," explains Mike Rice. "It wasn't really an issue on Kingston Carton's Visioncuts, because they are relatively new machines, but if we had found that the oil was burnt, or contaminated, or contained metal residues, we'd have to investigate further before carrying out the oil migration."

As the analysis reported no problems, Bobst technicians carried out the migration on Kingston Carton's equipment which involved emptying all of the machine's lubrication systems and introducing flushing products, which were then left



One handed grease gun with food grade lubricant.

overnight before being removed and replaced by Bobst NSF-H1 lubricants. The transformation programme also involved replacing all mineral oil based greases used in the machines, for example those lubricating stripping units, as well as cleaning and re-lubricating chain guides and gripper bar chains, and cleaning or replacing all of the filters in the affected systems.

Oil Changes

With environmental regulations requiring the safe disposal of all lubricating oils, whether mineral based or synthetic, Kingston Carton took the opportunity to add Bobst Oil Cleaners to the migrated machines. These

of our regular preventative maintenance. That meant that twice a year we had to buy new oil, take the machines out of service for several shifts and also pay for the disposal of the old oil. Now, with the oil cleaners, it could be years before we need to do that again."

In fact, says Alan Smith, the time needed to carry out the whole migration process, including fitting the new oil cleaners, was less than the company sets aside for a six-monthly oil service. "We didn't lose any time on the day, and we'll be saving time every six months from now on."

Able to retain particles as small as 3 µm, the oil cleaner not only maintains the lubrication properties of the oil, but also

its cleaning properties. Regular checks of the oil cleaner filters allow the company to see what contaminants are being trapped, while analysis of the oil will give an early warning of any potential problems. "From the converters point of view, by having the oil cleaners and doing the analysis, you get longevity of your equipment," adds Arend Buitendam. "In essence it's preventative. You are saving time and money while also pre-empting a major breakdown. If I was buying a new machine from Bobst today, I would be specifying food grade lubricants and oil cleaners from the beginning."

Banned Products

Now that the Bobst food grade lubricant range has become available, Alan Smith says that Kingston Carton has been able to ban the use of mineral oil lubricants from all of its equipment involved in processing food packaging, from print right through to folding and gluing. "Sixty percent of our work is packaging for food, a lot of which is for direct food contact. So it's a very significant proportion of our turnover and we have to safeguard that. We run our machines at the fastest possible speeds and lubricants can splash onto the product, particularly when you are running a full-sized sheet. We are always very thorough in checking and removing any affected sheets, but when you're producing six million units a day, it's a lot of units to be checked. Even with food grade lubricants in the machines we still have to do that, but we know that if any do get through then it will be simply a cosmetic problem and there will be no risk to consumers' health — or to the financial wellbeing of our company. It makes me sleep better at night!"

Along with migrating their Bobst die-cutters and folder-glueers to food grade lubricants, Kingston Carton has also banned the use of mineral oil derived cleaning products such as WD-40 and a range of other aggressive cleaning products. "We were worried about what potentially toxic chemicals we were using that might come into contact with a board or a carton," explains Arend Buitendam. "Rolling out

The Dangers of 'White Oil'

While there are several types of food safe lubricants on the market, Mike Rice says that, unlike the Bobst NSF-H1 range, most do not have the lubrication or cleaning properties needed for today's manufacturing equipment. "We have seen some real horror stories where customers have started using untested lubricants in their die-cutters — they have overheated and seized up. That can cause hundreds of thousands of pounds worth of damage to a machine, not to mention the cost of the down time incurred."

Such lubricants are often based on 'Medical White Oil', which is derived by cracking crude mineral oil to remove all the dangerous components. "Unfortunately it's these same dangerous components that provide the lubricating characteristics," explains Mike Rice. "So an additive package is needed to regain its lubrication ability and to fulfil the H1 requirements. Unfortunately the characteristics of the White Oil base are inferior to those of the PAO synthetic oil base that we use in our Bobst NSF-H1 lubricants."

Other base oils, such as poly-glycols, have good lubricating properties, but can attack seals and protective paint, says Mike Rice. "That causes blocked valves, blocked lubricating pipes and severe damage."

Bobst UK and Ireland will be featuring the food-grade lubricant transformation programme during its annual Open House event, which this year will be held on the 5th & 6th July at the BOBST Competence Center in Redditch, England.

the use of food-grade cleaners through the whole factory was, as far as I was concerned, a no-brainer. And it was easy to do. Bobst have all the food-grade chemicals as well as all the lubricants. It made perfect sense to us. Along with the crews we looked through the COSHH sheets for all the cleaning chemicals we were using and then we showed them what we were going to replace them with. They were all on-board straight away. Then I marched through the factory removing all the stuff we had just banned!"

Alan Smith says that Kingston Carton made a point of involving the machine



operators in the migration process as well. "When the Bobst technicians came in, the operators got to see parts of the die-cutters that they never normally see and they got to clean things they can never normally get at. They all realise that the old ways are no longer fit for purpose in today's manufacturing environment and by carrying out this migration, and only using food safe cleaning agents throughout production, they are safeguarding their own jobs."

Customers Notice

Mr Buitendam says that while many of Kingston Carton's customers are already insisting on the use of food grade outers and hygienic, plastic pallets, any requirement for mineral oil free manufacturing environments is not particularly on the packaging buyer's radar. "I don't think it will be long though. As more stories come to light about mineral oil contamination of food by its packaging, consumers will start to put pressure on brand owners and that will soon push back down the supply chain."

Nonetheless, Arend Buitendam sees their mineral oil free production environment as a selling point for The Kingston Carton Company. "We've recently had two audits by potential new customers and it



NSF-H1 sticker

becomes a talking point because all the machines have Bobst NSF-H1 stickers on their lubrication units and we have a Bobst 'Green' certificate on the wall recognising

our contribution to the environment by implementing the programme. Those buyers are now going back to their current suppliers to find out what they are doing

about mineral oil contamination. There is a real issue here for packaging buyers to be aware of.”

Regardless of what may happen in the future, for Arend Buitendam, the main driver behind the migration programme was to give his customers a high level of reassurance that there is no risk lurking in the packaging they receive.

“They know that we take responsibility for the products they ask us to produce and they can be sure that there are no nasties infiltrating the manufacturing process. It’s all about good manufacturing practice — and to me this programme has taken us to a different level. I’m really surprised that not more people are doing it. As far as I’m aware, we are the only folding cartonmaker in the UK to implement food grade lubricants and cleaning products throughout their food packaging production.” ■