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Challenging Illegal
Chemical Sampling

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Turning a blind eye to illegal chemical sampling

Bruce Percy, managing director of **SampleRite UK**, looks at the dangers and possible repercussions of the mis-declaration of hazardous samples

SampleRite UK is a specialist in providing a global sample management service to the chemicals industry. The company has been preparing and dispatching both hazardous and non-hazardous samples from a site at Elland, UK, since 1994. It recently set up a facility at Qingdao in Shandong province, China.

Based on its work in both the UK and China, SampleRite has discovered that, whilst on the face of it regulations concerning air freight (the International Air Transport Association (IATA) Dangerous Goods Regulations) and sea freight (the International Maritime Dangerous Goods (IMDG) Code) are being adhered to by many chemicals companies shipping hazardous chemical product worldwide, the perception is far from the reality.

Small samples of hazardous chemicals are knowingly being dispatched by many Asian chemical companies, re-labelled and packed as non-hazardous in order to avoid the additional costs incurred by correct packaging, training and paperwork, as required to comply with the IATA and IMDG regulations. Health and safety regulations are knowingly being flouted to save money and the consequences could be fatal.

These practices are putting many personnel within the supply chain – and sometimes the general public – at risk. Anyone opening a package that

they believe contains non-hazardous chemicals could be exposed to dangerous liquids, powders or fumes. Workers are unlikely to have taken adequate precautions or to be wearing the correct personal protective equipment in such cases.

The problem is getting worse with the shift in chemical manufacturing from its traditional base in Europe to sites in Asia, particularly China. Today, many of the world's major chemicals companies source from China, have operations in the region or outsource production to Chinese manufacturers so that they can compete in an increasingly price-sensitive and commoditised market.

This means that more and more samples are now being sent overseas in order to drive sales. Unfortunately, too many samples dispatched out of China are being shipped under false pretences.

To say this, incidentally, is not to blacken China's name. On the contrary, the problem is far more acute in China itself and, as usual with these scandals, the vast majority of the victims are Chinese.

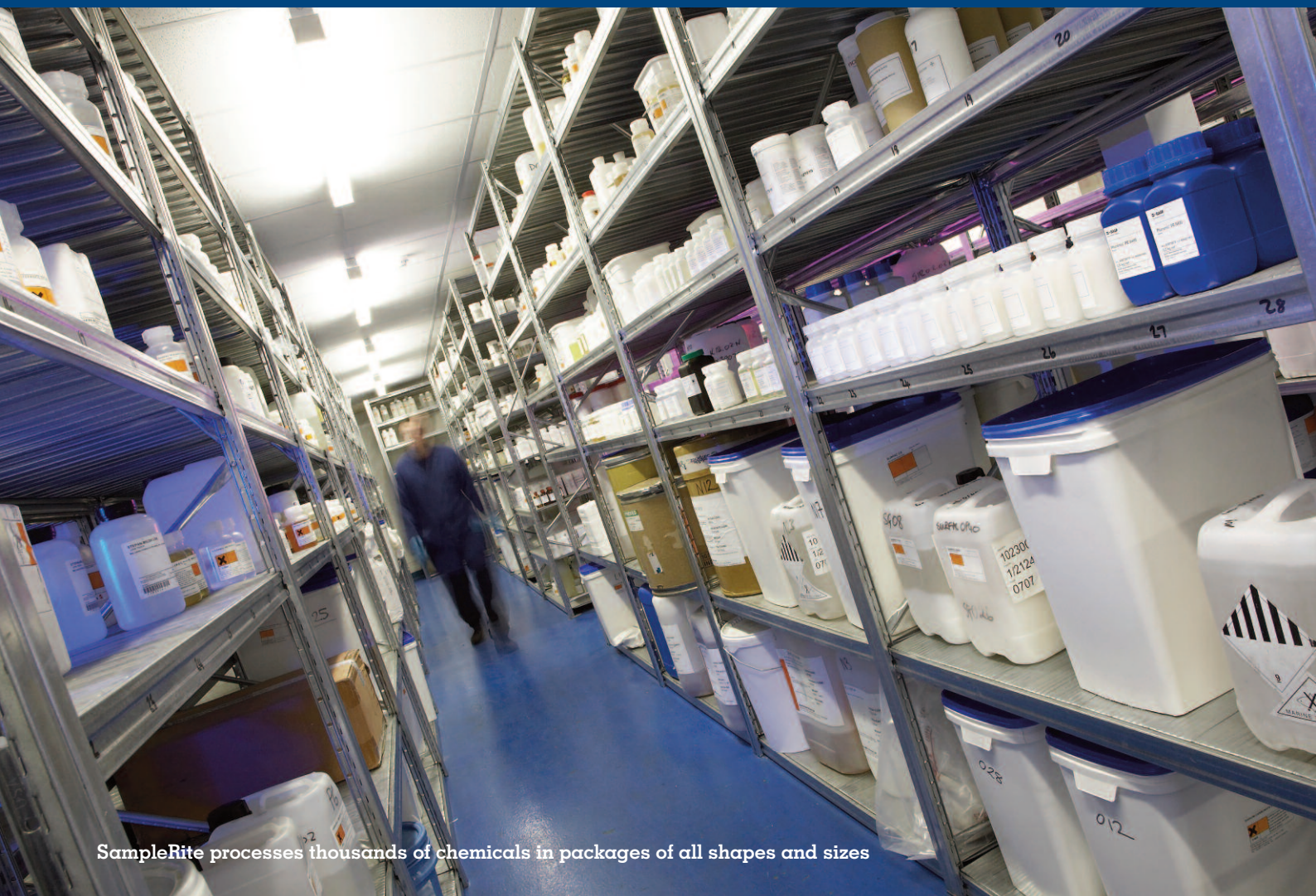
Consider, for example, one poor man in China who died in November 2013 as a result of a leak in transit of methyl fluoroacetate, a commonly used pharmaceutical

intermediate which can cause convulsions or respiratory problems if inhaled or ingested incorrectly. He was not in any way involved in the chemical supply chain; he had ordered some shoes for his daughter online and that package came into contact with the leak. The production manager at the firm in Hubei that sent the chemical out was later arrested.

Anecdotally, at least, it appears that such incidents are not uncommon. Many cases of chemical poisoning have been reported by Chinese



Percy – Chemical companies must take responsibility themselves



SampleRite processes thousands of chemicals in packages of all shapes and sizes

express delivery firms who do not have a licence to deliver or transport chemicals. So why is this happening? It is largely the unintended consequence of a booming market, where vast numbers of firms trade small amounts of chemicals, coming up against stricter regulation and bureaucracy.

In 2011, China began to implement new basic rules on chemicals. These, ironically, had just come into place by the time of the aforementioned fatal incident. They stipulate that all companies transporting hazardous chemicals must use appropriate vehicles, train workers adequately and keep hazardous and non-hazardous goods apart in transport and in depots.

Every link in the chain is subject to licensing and all chemical products must have an identification certificate before being accepted by airlines, in conjunction with the standard hazardous paperwork. Certificates are issued for each individual product

by testing bodies, such as DGM or the Shanghai Research Institute, to confirm its identity.

One effect of all this is to make the added cost shipping of hazardous chemicals even more expensive, relative to non-hazardous ones, than before. At the same time, however, only major chemicals companies and transportation companies, many of which are still state-owned, are allowed to deliver chemicals.

In the main, these companies think in tonnes when quoting prices and are not interested in delivering gram quantities – or, if they do, they charge very high prices and/or have very long lead times. The government remains reluctant to open this market up to private firms.

The net result of all this is that many chemists and lab scientists deliver samples themselves, if the distance is drivable. Where it is not, they usually resort to using regular courier firms, who are not licensed or equipped to handle hazardous chemicals.

In some cases, companies have obtained a certificate for a non-hazardous product and use this to ship the hazardous product - on the face of it legally and at a considerable cost saving. Competition in this field is cut-throat, with extremely low margins, making courier firms reluctant to turn any order down, even in the unlikely event that they are able to know what the consignment actually contains.

The problem inevitably extends internationally and could threaten the lives of airline passengers and ground personnel. In 2007, for instance, 11 ground personnel at Taiwan Taoyuan international airport in Taipei were injured and two hospitalised as a result of leakage from an undeclared Class 8 DG corrosive on a flight from Hong Kong. This was part of a consignment from Shanghai that was claimed to be general and which was accompanied by a laboratory certificate and a Safety Data Sheet.

(Not, incidentally, that the problem is unique to China. Back in 1998, an

American Airlines flight from Dallas-Fort Worth to Nashville experienced an outbreak of fire in the cargo compartment because of "undeclared and improperly packaged hazardous materials" in a fibre drum, including hydrogen peroxide and sodium orthosilicate-based material. Other incidents have involved chemical oxygen generators, nitric acid and flammable liquids in lab machines.)

SampleRite knows that practices like these are widespread because we have received supplies of clients' products that are incorrectly labelled and packaged, which have been sourced and manufactured in China. We get situations relatively frequently where the outer box indicates one product (non-hazardous) but within the box the product and paperwork are completely different (hazardous). This effectively means the actual packaging type (bottle and box) may also be illegal.

If a delivery has not been labelled or packaged properly, we immediately contact our clients to make them

aware of the situation. Our clients are usually taken aback by the revelations. The question here is, do European companies want to deal with and source material from Chinese companies who blatantly break the law?

The issue is creating enormous confusion and compromising safety, so it is important to flag it up. The fact that sample management is not a core function for most chemical manufacturers and distributors is clearly exacerbating the problem. All products have to be sent away for certification before being decanted in controlled conditions, packaged correctly, labelled in line with current legislation and shipped via approved transport companies. All this takes time and money.

Given the costs involved, when companies try to do this themselves, many cut corners to save on shipping fees. The difference between sending hazardous samples legally and illegally between China and, say, mainland Europe can be as much as

500%. Unfortunately there is no way round the financial implications unless laws are broken.

Our industry should stop turning a blind eye to these dubious practices. Many companies know that these practises occur, but too little is being done to prevent it. It is not the couriers, freight forwarders or airlines who are at fault, it is the chemical companies themselves who should demand that best practices are followed at all times, as should the customer who receives the sample.

If a European chemicals company has outsourced its manufacturing to China, it needs to ensure that the samples dispatched in its name are sent legally. If an incident occurs because labelling has been falsified or if a sample is stopped at customs during a routine check-up, the manufacturer or distributor concerned could face prosecution and severe financial penalties (*see box story opposite*).

The European chemical company that asked this manufacturer or



Sampling is a complex, multi-stage process

Key regulations

The IMDG Code was developed as a uniform international code for the transport of dangerous goods by sea covering such matters as packing, container traffic and stowage, with particular reference to the segregation of incompatible substances.

You need to complete a dangerous goods notification (www.gov.uk/government/publications/dangerous-goods-declaration-note) is the standard one in the UK) for any dangerous goods you want to send by sea. You can be fined for breaking the regulations on transporting dangerous goods. You can be prosecuted and face a large fine and a prison sentence for serious breaches, for example transporting animal by-products in an unsafe way.

The internationally agreed rules for transporting dangerous goods by air are covered by IATA's International Dangerous Goods Regulations (www.iata.org/publications/dgr/pages/index.aspx).

You can be given an unlimited fine or sentenced to two years in prison or both if your cargo fails an inspection or causes a safety incident in the UK.

Anyone packing dangerous goods for air transport must be specially trained (see, for example www.caa.co.uk/default.aspx?catid=1464&pagetype=90&pageid=8298). You and your staff must have dangerous goods training if you are using your own aircraft to transport the goods. For the UK, Civil Aviation Authority-approved dangerous goods training organisations is available on the web (www.caa.co.uk see 'Dangerous Goods' sub-section of 'Operations & Safety' section).

The internationally agreed rules for transporting dangerous goods by road are covered by the European Agreement concerning the International Carriage of Dangerous Goods by Road, or ADR of 2103 (www.unece.org/trans/danger/publi/adr/adr2013/13ContentsE.html). There is a range of fixed penalty fines if your cargo fails a spot check.

Case studies

On 17 August 2012, at Isleworth Crown Court, Angel Case & Packing pleaded guilty to 'Causing to be delivered for loading onto an aircraft dangerous goods which it knew or ought to have known or suspected to be goods capable of posing a significant risk to health, safety or property when carried by air, when the packaging did not comply with the technical instructions and the packing was not in a fit condition for carriage by air' under Regulation 5(1) of the UK's Air Navigation (Dangerous Goods) Regulations of 2002. It was fined £25,000.

The defendant, a specialist packing company, had collected 51 chemical oxygen generators from an aircraft spares company in August 2011, which were to be transported on a cargo flight to Italy. It packed them in three boxes and handed them over to a freight forwarding company. Here, a dangerous goods specialist was concerned about the consignment, although it was appropriately marked and labelled.

When the consignment was opened and inspected it was found that: (a) the UN certificate for the boxes had expired more than ten years previously and was not valid for chemical oxygen generators in any event; (b) each box had one loose generator on top, contrary to the requirement for tight packing; (c) polystyrene chips had been used as packing material when

they should not have been and the chips had penetrated the chemical oxygen generator box vent holes; and, (d) a document pouch had been placed inside one of the boxes which should not have been.

In another case heard at Chelmsford Magistrates Court on 12 June 2012, Atom Scientific pleaded guilty to five offences under different parts of the Air Navigation (Dangerous Goods) Regulations and was fined £1,000 for each of them:

1. Causing to be delivered for carriage in an aircraft dangerous goods which it knew, or ought to have known or suspected to be, goods capable of posing a risk to health, safety, property or the environment when carried by air when the technical instructions had not been complied with (Regulation 5(1))
2. Consigning dangerous goods for carriage by air without ensuring that the goods were packed according to the technical instructions (Regulation 11(d))
3. Consigning dangerous goods for carriage by air without ensuring that the package in which they were contained was marked and labelled as specified in the technical instructions (Regulation 11(e))
4. Consigning dangerous goods for carriage by air without ensuring that the operator of the aircraft had been furnished with the dangerous goods transport document (Regulation 11(i))

5. Not ensuring that all persons involved in the preparation of dangerous goods had received specified training (Regulation 13(1))

This case related to two cylindrical packages that arrived at the FedEx premises at London Stansted airport on 5 May 2011, shipped by Atom Scientific and to be loaded on a cargo aircraft flight to Paris Charles de Gaulle. The contents of the consignment were recorded on the air waybill as 'Distilled Water'.

One of the cylinders was found to be leaking its contents as it was being loaded onto a conveyor belt. The bottom of the cylinder had disintegrated. Seven FedEx employees experienced tingling and burning sensations to their skin and their skin turned white. The burns were treated on site with saline solution and burn gel.

Atom Scientific later informed FedEx that the contents were hydrogen peroxide. Hydrogen peroxide solutions act as oxidising agents and are corrosive.

Hydrogen peroxide is not flammable but can cause spontaneous combustion of flammable materials (i.e. if it comes into sustained contact with cotton, wool, wood, paper, textiles, dirt, oil or dust it can cause a fire). It can evaporate and the concentrated material can react violently with many chemicals, either explosively or causing a fire.

distributor to dispatch samples on its behalf could suffer irreparable damage to its reputation in the market. Clearly, then, companies involved with the transport of chemicals need to be aware of the various international transportation regulations and the specific training that employees are required to take (see box story opposite).

To send any hazardous sample overseas requires that the product is first identified with a four-digit UN number. Over 3,000 UN numbers are listed and published as part of the Recommendations on the Transport of Dangerous Goods, which is also known as the Orange Book.

IATA's Dangerous Goods regulations are constantly changing

and that impacts how samples must be classified and packaged. Companies and individuals that fail to comply fully with the current rules are subject to severe and unprecedented enforcement actions. It is now more critical than ever that anyone involved in shipping samples is fully trained and up-to-speed on the latest laws and standards.

So chemical companies that regularly send out hazardous samples from China by overseas carriage have three options if they are to ensure all samples are dispatched with the correct paperwork.

Firstly, they could set up and train a team in-house to handle sample requests, which is costly and time-

consuming. Secondly, they can enlist the help of one of the major courier companies to complete the relevant paperwork on their behalf, which is typically very expensive. Or they could look to outsource the process to a company that offers a dedicated sample management service, which is often the most cost-effective option.

Providing samples is an involved process. The chemicals have to be stored correctly prior to decanting, technicians must be trained to handle these substances safely; the right type of packaging must be used depending on the sample; an up-to-date health and safety data sheet must be included; all labelling must meet the legal requirements; and finally,



Sampling at SampleRite's UK laboratories

accompanying paperwork must be filled in correctly by trained personnel before the courier company will agree to deliver the package.

For many companies it is simpler and more cost-effective to outsource the process rather than invest in the recruitment and training of staff, not to mention temperature-controlled storage areas, cleanrooms and laboratory facilities for handling the chemicals and extra space to keep a supply of packaging materials. On many levels an outsourced sample management service can be much more efficient than handling it in-house.

SampleRite has a web-based password protected 24/7 ordering facility that allows clients to log sample requests from their customers. Subject to stock availability it can then send samples out within 24 or 48 hours. At the end of each month management reports are prepared so our clients can see exactly where their product has been sent.

SampleRite currently dispatches over 50,000 samples each year on behalf of its clients, who benefit from the high volume discounts on freight costs that the company has negotiated with the major courier companies. The company can handle a variety of

hazardous and non-hazardous chemicals, including dyes, corrosive, toxic and flammable products, food and pharmaceutical grade. This allows clients to focus on their core manufacturing and distribution activities.

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