White Paper

Something Smells wrong: are Lives being put at Risk by Conveyor Belt Manufacturers

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The harmful and, in many cases, potentially lethal substances used in industrial manufacturing processes have been a cause for concern for many years not only amongst consumers but also those who come in contact with them in the course of their day-to-day work. When the European Union's REACH regulation EC 1907/2006 came into force in June 2007 those concerns should have largely been dispelled.

All European manufacturers (including manufacturers of rubber conveyor belts) became legally obliged to comply with the regulations relating to chemicals,

preparations (mixtures) and substances used to create finished products.

Some 12 years since their introduction, conveyor belt consultant Leslie David decided to take a closer look into the impact of the regulations and soon discovered that when it comes to conveyor belts, something smells wrong in more ways than one. It appears that a great many belt manufacturers have chosen, either completely or at least partially, to ignore this legal requirement. Here he explains about REACH in greater detail and why users of rubber conveyor belts need to be much more aware of the potential risks they may be taking.

REACH for Safety

REACH (Registration, Evaluation and Authorisation of Chemical substances) regulation EC 1907/2006 was introduced to improve the protection of human health and the environment from the risks that can be posed by chemicals. The legislation compels all European-based manufacturers to register the use of “substances of very high concern” that are listed within the regulations with ECHA (European Chemical Agency) headquarters in Helsinki. Incidentally, in the event of a no deal, the EU REACH Regulation will be brought into UK law by the European Union (Withdrawal) Act 2018.

What are the risks?

Always wear gloves when working with rubber belt.

There are two primary areas of potential risk relating to end-users of rubber conveyor belting. Firstly, those that work with conveyor belts are coming into regular with rubber that contains unacceptable levels of potentially harmful chemicals, including those believed to cause various forms of cancer. This especially includes conveyor maintenance operatives and the vulcanizers who fit and splice belting.

The second area of risk is to the environment itself including wildlife. The disposal of used belting has long been a headache for end-users. It is virtually impossible to regulate and control disposal but if the harmful, damaging element of the used products, in this case rolls of conveyor belt, can be minimized then that would be a huge step forward.

Who does REACH apply to?

REACH applies to all European-based manufacturers and all products sold and used within the EU. Manufacturers established outside of the EU are not bound by the obligations of REACH, even if they export their products into the customs territory of the European Union. They are therefore free to use unregulated raw materials and chemicals that may be prohibited or have usage limitations within the European community. Very importantly, as the EU destined product itself is not exempt from REACH, it is therefore the importers of products manufactured outside of the EU who are responsible for fulfilling the requirements of REACH rather than the original manufacturers.

A very significant proportion of (REACH) unregulated belting sold in Europe is imported from South East Asia by traders. This raises a number of questions concerning human and environmental risk exposure. First and foremost, end-users are effectively required to rely on the honesty and integrity of the trader who in turn is reliant on the honesty and integrity of a manufacturer who is not actually subject to the regulations. European conveyor belt manufacturers could also justifiably argue that they are at a disadvantage. This is because hazardous chemicals that would otherwise be either banned entirely or at least restricted are used to accelerate the vulcanization process in order to reduce production time, which ultimately creates a price advantage based on illegal practice.

Interestingly but somewhat worryingly, with only one notable exception as far as I can tell, all European-based belt manufacturers import and re-sell belting to supplement their overall output and allow them to be more competitive on price. Again, the vast bulk of these imports come from China and to a lesser extent India. They are then sold under the European manufacturer's brand. Anecdotal evidence suggests that in some cases such re-selling is supported by certificates of origin that indicate Europe as the source of origin, apparently on the basis that the belting was at one stage warehoused in Europe.

A chemical Cocktail

So exactly what are the potentially dangerous materials used in modern-day conveyor belts? Nylon, polyester and steel cords are most commonly used to form the 'carcass' of the belt. These materials are contained within the belt and are not seen as posing a risk in their own right. Apart from PVC covered belts, which are mostly used for underground mining, rubber is most commonly used to cover and protect the carcass. Although rubber in its natural form (NR) presents little or no risk, the fact is that most of the rubber used in conveyor belting is synthetic.

Synthetic rubber contains hundreds of different components.

The simple reason for this is that modern-day conveyor belts have to deal with a multitude of different demands including abrasion, heat, oil, ozone, fire, Sulphur and much more; much of which natural rubber usually cannot adequately cope with. Consequently, there are literally hundreds of different components that are

needed to create rubber compounds that, once vulcanized, are able to meet the specific physical performance and safety requirements.

The manufacture of synthetic rubber involves several chemical compounds that are toxic to man. The principal chemicals used in the manufacture of synthetic rubber are (1) butadiene, which is also known as methyl allene, (2) styrene, also known as vinyl benzene and (3) acrylonitrile, or acrylonitryl-vinyl cyanide. In addition to these chemicals, polymerization catalysts such as hydrogen peroxide, sodium perborate, ammonium persulfate or organic peroxides or peracids, modifying agents, anti-degradants, anti-ozonants (to protect against ozone and UV exposure) are also used.

It is worth bearing in mind at this stage that the use of chemicals in the rubber compounds used for manufacturing conveyor belts is both essential and unavoidable. One such example is N-cyclohexyl-2-benzothiazole sulfenamide (CBS), which is fully allowed within the regulation. However, the big issue is whether manufacturers are continuing to use prohibited chemicals and/or are failing to apply the maximum usage levels restrictions specified within European REACH regulations.

Smelling the Difference

Are manufacturers complying with REACH regulations.

One of the most contentious issues involving conveyor belt manufacture is the use of short-chain chlorinated paraffin’s (SCCP’s). REACH regulations stipulate that SCCP’s should either not be used at all or at least only used on a very restricted basis because of their category 2 carcinogenic classifications. They also pose a threat to the environment, which is why they are also subject to the Persistent Organic Pollutants (POPs) Regulation in the European Union (EU).

SCCP’s are most commonly used in Asia where their use effectively remains unregulated. Their presence can usually be identified by the unpleasant smell of the rubber. According to rubber compound experts, good quality rubber usually has very little smell whereas low quality belts containing questionable levels of

hazardous chemicals such as SCCP’s often produce a highly pungent aroma. In other words, you can literally smell the difference!

An Offer you can’t refuse?

The influence of raw material costs on the selling price is highly significant. Although there can never be a fixed formula due to the wide variety of individual belt specifications, a general ‘rule of thumb’ is that raw materials represent some to 75% of the cost of producing a conveyor belt. Thanks to the high level of automation, the labour cost element is very low.

When faced with a price that looks “too good to refuse”, it is therefore perfectly reasonable to conclude that raw materials of questionable quality have been used. The pressure to keep costs to an absolute minimum has increasingly led to the use of sub-standard raw materials and recycled rubber that can often be of very dubious origin. Within recycled rubber there is, almost inevitably, a higher risk that potentially harmful chemical substances are present.

Working safe

Masks prevent inhalation of dust particles.

The application of basic safety precautions for those working with conveyor belts is a must. Firstly, it is advisable to wear gloves when handling belts. A mask should always be worn by anyone involved in actions that may cause rubber dust to be produced (such as grinding during the preparation of splice joints for example) to prevent inhalation of dust particles. Washing your hands thoroughly before eating, drinking or smoking is also very important.

A clear and present Danger

Although Brussels can often be accused of over-zealous regulation, the use of potentially harmful chemicals and materials is without doubt a clear and present danger. It is not my intention to scaremonger but it is nevertheless vitally important that users of rubber conveyor belts make themselves aware of potential hazards.

My concluding advice is therefore to make REACH compliance a pre-requisite when choosing what conveyor belts to buy. Always ask for written confirmation from the belt manufacturer or supplier that the product they are buying has been produced in compliance with REACH EC 1907/2006 regulations.

You can find more information on REACH regulations by visiting: http://ec.europa.eu/environment/chemicals/reach/reach_intro.htm