Office for Product Safety & Standards

Small High Powered Magnetic Products

OPSS Risk Summary

The Product

OPSS has been made aware of an increase in medical interventions that have been required to treat children who have ingested small high-powered magnets. Based on information provided by clinicians in terms of the types of products that are being ingested, as well as our own research, we have identified several products we consider could give rise to a harm to the user if ingested, with particular attention to more vulnerable users, such as children.

These are:

1. Novelty items comprised of small high-powered accessible magnets. Commonly marketed as desk toys or stress relievers, these products can be used to create pattens and shapes. Included also in this category are small non-food imitating novelty magnetic stationery (fridge/notice board magnets) that may have a play value because the design is child appealing and the product is defined as a small part when it is in its entirety (i.e. it doesn't need breaking down).
2. Magnetic mouth or nose jewellery. Marketed as 'fake piercings', these are products comprised of two or more magnetic parts and are designed to be worn in the mouth or nose.
3. Magnetic ear and/or body jewellery. These products are not necessarily marketed as suitable for wearing in the mouth or nose, but it is considered foreseeable, due to the design, that they can be worn this way.
4. Magnetic glassware charms. These are novel products used to identify drink glasses (assumed to be most useful when identical glasses are being used). The magnet charm is marketed to be attached onto the side of the glass.

Principally, the products are regulated by the General Product Safety Regulations, however, for some products, the design, appearance, marketing and supporting information may mean it is regulated by the Toys Safety Regulations and/or Food Imitations (Safety) Regulations.

The Issue

The hazard under consideration is in relation to the injury to soft tissue caused by two or more magnets (or at least one magnet and one ferromagnetic object) attracting to each other across or either side of internal soft body tissue. A compression injury can occur to external body parts, such as by placing a high-powered magnet either side of the earlobe. However, when small high-powered magnets are ingested, the evidence suggests the harms can be more severe and can include pinching, twisting,

compression, perforation and/or formation of fistulas in or of soft tissue, particularly along the digestive tract. Treatment is often in the form of invasive interventions, including surgery. OPSS is aware that whilst no fatalities have occurred in the UK in relation to magnet ingestion, they have occurred outside of the UK.

The ingestion of small, high-powered magnets is a recognised hazard referenced in the European Standard EN71-1:2005+A8, Safety of toys – Part 1: Mechanical and physical properties. It is this Standard that sets the limit value for the magnetic flux index of 50 kG^2mm^2 along with a supporting rationale and the exemption in relation to magnetic/electrical experimental sets. The Standard also notes that, if ingested, weak magnets (a magnetic flux index below 50 kG^2mm^2) can apply enough pressure to cause a severe harm in the event the two weak magnets end up on opposite sides of the intestinal wall where the intestinal wall is extremely thin. However, the Standard reflects the probability of this event is very low.

The products in scope of the incident are relatively novel and consequently there have only been a few cases of products with accessible small high-powered magnets reported by Market Surveillance Authorities (MSAs). By comparison, MSAs have identified a greater number of toys with a magnet that is contained in a larger component and that becomes accessible if a force is applied.

Magnetic products advertised for use specifically on the nose or mouth have been identified on online platforms and sellers' own websites but sellers are not UK based.

The Harm

This assessment is focused on the hazard from magnet ingestion which has also been the focus of the evidence gathering in relation to the incident. To understand the harm, OPSS has reviewed a range of evidence sources, including NHS data, product data, as well as carrying out a review of available literature in relation to the harm from small high powered magnet ingestion.

It was noted that bowel injuries resulting from swallowing two or more magnets can occur rapidly after ingestion and over two thirds of the cases considered in the literature review required operative management to remedy. We found that there was no clear correlation between the severity of harm and the number of magnets ingested.

The literature review did contain information on the shape of magnetic product ingested in some cases, with a trend in pediatric cases towards spherical magnets.

Product Users At Risk

Information that has been provided to the OPSS from stakeholders has specifically related to the risk to young children and young teenagers. Supervising adults may not be aware of the dangers from ingesting magnets, further, they may assume the product is safe if it is marketed as or looks like a toy. In relation to magnetic mouth or nose jewellery, which appears more commonly linked to ingestion in older children, the risk is created as a result of the product design.

The research confirmed foreign body ingestion in adults is rare and when it does occur, it is generally accidental. In relation to the glassware magnetic charms, it is assumed ingestion would be accidental.

The Risk Assessments

OPSS uses the RAPEX methodology to determine the product's hazard/s and the associated risk outcomes from those hazards. This risk summary addresses the risk from the ingestion hazard only. Some of the products that have been considered may also have other hazards present.

OPSS has risk assessed a range of products that are defined under 'The Product' section above. Injury scenarios have been developed and using the data gathered - including reports where the products have been tested against a Standard - product specific risk assessments have been produced. As part of these product specific risk assessments, OPSS has considered how variations in the product may affect the risk level for the ingestion hazard, such as the wording of any warnings, product description, marketing information or other information that accompanies the product. Of relevance are the size and shape of the product as well as its overall appearance, the magnet strength, what the set is comprised of and how the product is marketed to be used (including how it might be foreseeably used).

The Risk Level

In terms of ingestion the product specific risk assessments found the risk outcome to vary between low and medium level of risk.

- For the novelty items comprised of small high-powered accessible magnets, the risk was typically **medium**.
- For small non-food imitating novelty magnetic stationery (fridge/notice board magnets) that may have a play value because the design is child appealing and the product is defined as a small part in its entirety, the risk was typically **low**.
- For magnetic ear and/or body jewellery items, that are marketed to be worn on the ear or other body parts but could foreseeably be worn in the mouth or nose, the risk was typically **low-medium.**
- For magnetic glassware charms, the risk was typically **low-medium.**

The conclusion

For the harm in relation to magnet ingestion to occur, there is a relatively complex chain of events that needs to take place, including that at least two magnets have been ingested and that these magnets are drawn together either side of soft tissue as they pass through the body.

The consequence of ingesting two or more magnets can however result in the most severe injuries, and if an intervention is not timely, it is possible such ingestion can lead to death. As such, it can be regarded as a low likelihood, high impact event – in other words, it might be rare, but when it happens, the outcome can be very serious.

OPSS has been made aware of an increase in cases relating to magnet ingestion in children and young teenagers, and this is linked to two specific product categories – small magnetic ball sets and magnetic jewellery. It is noted too that the risks in relation to some of the products are inherent in their design, for example those products designed to be worn in the mouth (or it is foreseeable that they could be so worn) or they are small and accessible and potentially attractive to young children.